

	1 of 100	Performance Drilling Tool Hydraulic Fishing Jar Service Manual					
DOCUMENT NUMBER	CLASSIFICATION	DOCUMENT LEVEL	REVISION NUMBER	ISSUE DATE	PREPARED BY	APPROVAL	
GL-DRT-OEPS-L4-27	CONTROLLED	TECHNICAL MANUAL	C	May 2023	S.Kidd	M. Asrar	



DAILEY

HYDRAULIC FISHING JAR

SERVICE MANUAL

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Service Manual Contains the following part numbers:

p/n: 1509000	1-13/16 x 1/2 HFJ	p/n: 1503000	4-1/4 X 2-1/8 HFJ
p/n: 1510000	2-1/4 X 11/16 HFJ	p/n: 1504000	4-3/4 x 2-1/4 HFJ
p/n: 1505000	3-1/8 X 1-1/4 HFJ	p/n: 1804000	5" x 2 1/4" H2S DST HFJ
p/n: 1625000	3-1/8 X 1-1/2 HFJ	p/n: 1506000	6-1/4 x 2-1/4 HFJ
p/n: 1768000	3-3/4 X 1-1/2 HFJ	p/n: 1501000	6-1/2 x 2-3/4 HFJ
p/n: 3372000	3-3/4 X 1-15/16 HFJ	p/n: 1507000	7-3/4 x 3 HFJ
p/n: 3422000	4-1/4 X 1-15/16 HFJ	p/n: 1502000	8 x 3 HFJ

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CHAPTER: 2.00 – SAFETY

2.01 - Risk Involved When Servicing the HFJ

The HFJ has undergone a safety check and certification before shipment. Incorrect operation or misuse threatens:

- The life and limb of the operator and the surrounding personnel
- This device and other material assets of the operating authority
- The efficient performance of this device.

The servicing authority of this unit must ensure, that all persons having to do with, operation, cleaning, maintenance, testing, handling, repairing, and servicing of the unit must.

- Be qualified according to the requirements and authorized by the servicing authority.
- Follow this service manual thoroughly. It is recommended to the servicing authority, that all persons having read the servicing manual confirm the knowledge with their signature.

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2.02 – Safety Instructions and Hints

The following symbols are used in this manual:

 WARNING	WARNING
	Describes a possibly dangerous situation.
	Disregard can lead to death or severe injury.

 CAUTION	CAUTION
	Describes a possibly dangerous situation.
	Disregard can lead to minor injury

 NOTE	NOTE
	Describes a possibly harmful situation. Disregard can damage this device or other material assets in its working range.
	This sign also marks useful operating hints.

2.03 – Designated Use

The WEATHERFORD Hydraulic Fishing Jar is a single acting hydraulic jar designed for simple operation, variable hitting loads and extended periods of continuous jarring in fishing conditions. Using a patented hydraulic time delay / mechanical release system, the HFJ combines downhole reliability and long operating life under a wide range of fishing conditions and hostile environments.

 NOTE	NOTE
	Do not exceed torque values listed within the servicing manual. Over-torque to the jar components can result in injury to operators and/or damage to equipment.

Using the HFJ for purposes other than expressly mentioned above is considered contrary to its designated use and is therefore prohibited. The manufacturer cannot be held liable for any damage resulting from such use. The risk of such misuse lies entirely with the user.

Never make any modifications, additions, or conversions without the manufacturer's approval. Operating the jar within the limits of its designated use also involves observing the instructions set out in the operating manual and comply with the inspection and maintenance directives.

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2.04 – Source of Danger

During the repair and maintenance of the HFJ, possible sources of danger could be high pressure, heavy objects, and pinching points and slip hazards. Disregarding the safety instructions can lead to severe injury.

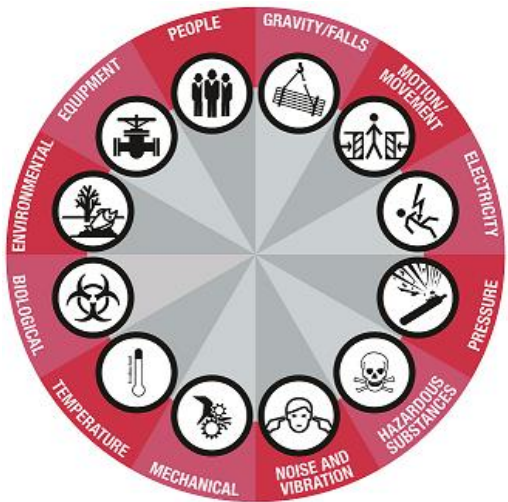
The servicing authority must ensure to service the jar **only** in unobjectionable state. Consider the above and follow these directives:

- Always use required personal protective equipment (PPE).
- During disassembly, oil will flow out of the remaining jar. Precautions should be made to capture this oil so a slip hazard can be prevented.
- Do not place any part of your body in the path of the fluid plug while removing it. Be careful when removing each fluid plug to allow all trapped internal pressure to bleed off while the fluid plug threads are still engaged.
- Do not stand directly behind the jar when removing the piston stop. Trapped internal pressure can cause the piston stop wrench to be projected from the tool.
- When cutting back-up wipers, cut away from body.
- Use proper manual handling techniques for components less than 40 pounds/20Kgs. Use overhead cranes and suitable certified lifting equipment to move items greater than 40 pounds/20kgs.
- Do not attach the airline to the jar before it is placed in the test rack.
- When strap is secured on the mandrel clamp, make sure the buckle is placed over the recess. If the buckle is subject to impact, it will be protected by the recess.
- Never make any modifications, additions or conversions which may affect the protective devices.
- Damaged/missing warning information or labeling on the unit must be replaced immediately.
- When rack testing jars, always point the pressure housing fluid plug downwards in the rack.
- Refer to the Hazard Identification matrix on next page to determine any additional sources or danger and risk mitigation required
- Always **STOP THE JOB** if you feel operations are unsafe or are unsure of how to continue operations in a safe manner.
- Conduct Toolbox Talks, Take 5, Job Hazard Analysis (JHA's) and review/update Risk Assessments prior to and during operations.
- Be very careful when installing / extracting the Truarc Snap Ring.

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Hazard Identification: Symbols & Symbol Guidance		
	Gravity / Falls	The force caused by attraction of all other masses to the mass of the earth. Examples: falling object, collapsing roof, and a body tripping or falling
	Motion / Movement	The change in position of objects or substances. Examples: vehicle, vessel, or equipment movement; flowing water; wind; and body positioning when lifting, straining, or bending
	Electricity	The presence and flow of an electric charge. Examples: Power lines, transformers, static charges, lightning, energized equipment, wiring, batteries
	Pressure	Energy applied by a liquid or gas that has been compressed or is under a vacuum. Examples: pressure piping, compressed cylinders, control lines, vessels, tanks, hoses, and pneumatic and hydraulic equipment
	Hazardous Substances	Including chemicals, lithium batteries, explosives – The energy present in chemicals that inherently, or through reaction, has the potential to create a physical or health hazard to people, equipment, or the environment. Examples: flammable vapors, reactive hazards, carcinogens or other toxic compounds, corrosives, combustibles, oxygen-deficient atmospheres, welding fumes and dusts
	Noise & Vibration	Sound is produced when a force causes an object or substance to vibrate, and the energy is transferred through the substance in waves. Examples: equipment noise, impact noise, vibration, high-pressure release, and the impact of noise to communication
	Mechanical	The energy of the components of a mechanical system, i.e., rotation, vibration, or motion within an otherwise stationary piece of equipment or machinery. Examples: rotating equipment, compressed springs, drive belts, conveyors, and motors.
	Temperature	The measurement of differences in thermal energy of objects or the environment, which the human body senses as either heat or cold. Examples: open flame, ignition sources, hot or cold surfaces, liquids, or gases; steam; friction
Hazard identification should be a systematic process and the wheel is used to ensure that the person(s) conducting the exercise have considered all categories and thus ensuring that the assessment is comprehensive. Each of the categories is considered in turn and hazards related the task/activity can be identified	Biological	Living organisms that can present a hazard. Examples: animals, bacteria, viruses, insects, blood-borne pathogens, improperly handled food, and contaminated water
	Environmental	The impact of our surroundings. Examples: weather conditions, simultaneous operations, confined spaces
	Equipment	Critical to Service Quality. Examples: critical installation, hold / witness point, special equipment, parameters, specifications
	People	Specialized or additional training requirements over and above normal role-based requirements.

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2.05 – Danger Zones

The service area or in its proximity where the risk of injury or health damage exists has to be declared as danger zone.

- Danger zones must clearly be declared and protected by barriers and/or labeled with warning signs to prevent unauthorized entering.
- Missing or unreadable warning labels at the unit or its surrounding area must be replaced immediately.
- During service, no other person than the service technicians must enter the danger zone.
- Only objects which are absolutely required for the service of the jar are allowed to be placed inside a danger zone.

2.06 – Qualifications of Personnel

Only personnel familiar with the handling of jar equipment and trained and properly instructed concerning service may service the jar. The individual responsibilities of the personnel who operate, set-up, maintain and repair this jar must be stated clearly. Remember, during servicing the technician is responsible for third parties. Only personnel sufficiently competent, trained and certified in handling jar equipment may repair tools.

Unclear responsibilities are a safety hazard.

The servicing authority must ensure that:

- The service manual is available to all involved personnel
- All involved personnel have read and understand the contents of these manuals, in particular the chapters on safety, before beginning work.

2.07 – Technical Alerts & Bulletins

Please refer to Technical Alerts & Bulletins prior to commencing Repair & Maintenance procedure to ensure that any recent updates or changes are referenced and applied.

Alerts and Bulletins can be found in OEPS and via the following link

[Performance Drilling Tools – Alerts & Bulletins](#)

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2.08 – Protective Clothing

The protective clothing required for using the jar is the same as that typically used on drilling rigs. These requirements are determined by other equipment used in conjunction with the servicing of the jars as they require a higher level of protection.



Hard hat to protect the head against falling parts and overhead equipment.



Eye protection glasses must be worn to protect against flying particles.



Safety boots to protect against erroneous rest of the equipment.



Safety gloves to protect the hands against aggressive grease, lubricants, and mud.



Hearing protects to prevent hearing loss from loud noises.

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CHAPTER: 3.00 - INTRODUCTION

This manual is written for the purpose of aiding employees of Weatherford International plc., its agents, and affiliates, who through the authorization of Weatherford International plc, have been selected and trained to operate, test, and maintain the products specified here within. All manuals are the sole property of Weatherford International Inc. Any duplication of any type or form is prohibited. Manuals, in their entirety, are required to be returned to Weatherford International Inc. upon demand.

All instructions and depictions contained in this manual are to be considered true and accurate as of the date of release.

Updates and revisions will be released and accessed through Weatherford OEPS Online under the Performance Drilling Tools Product Line [Technical Manuals](#).

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Technical Manual: Hydraulic Drilling Jar Big Bore Service Manual
Hydraulic Drilling Jar Big Bore Service Manual to be referenced during every service of tool covered in the scope of this document





Release Date 10/22/2021

All employees should ensure they are using the latest revision of the manual to avoid errors in assembly, testing, preparation, and/or care of products.

Any improvements to established procedures within this manual are welcomed and will be reviewed upon receipt.

Submit any suggestions to the Engineering Dept. through the Weatherford Interactive Support Engine (WISE).

Wise Queries can be submitted in the link below or can be found on [Weatherford Exchange Applications](#).

[WISE](#)

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CHAPTER: 4.00 – REPAIR & MAINTENANCE (R&M) SERVICE LEVEL SELECTION

All R&M tasks related to Weatherford Impact Tools should be processed through MyAdvisor system.

Upon equipment return the tool must be assessed using the decision tree detailed in section 4.02.

Service Level I is defined as Repair & Maintenance tasks related to tools returned unused from the field. Please follow steps as directed through the Testing & Inspection (T&I) Process Flow Traveler (PFT) for the specific tool

Service Level II or III can be conducted on the WFT Dailey Hydraulic Fishing Impact Tool dependent on specific conditions the Jar has been operated and returned to an approved service location to conduct Level II Servicing. Please follow steps as directed through the Service & Repair (S&R) PFT for the specific tool.

For a level II service to be conducted on a Fishing Impact Tool it must satisfy all the requirements detailed in the decision tree and must be recorded in the AIRT for the tool in MyAdvisor system.

Job Data must be recorded in Weatherford Performance Tracking System (WPTS) upon equipment return to include operating and jarring hours of the tool based upon client information.

Operational limits (which must not be exceeded) for R&M Service Level II to be conducted on Dailey Hydraulic Fishing Impact Tools are:

1. 150 maximum accumulated Operating (Below Rotary Table) Hours
- and/or
2. 80 hours accumulated Jarring Hours. Jarring Hours are defined as hours tool has been subject to activation such as working of string in fishing operation and/or actual jarring time, but not when the pipe is idle for extended periods during other operations such as circulation, spotting a pill, etc.

Whichever accumulated limit is reached first will trigger **Service Level III** R&M requirements as detailed in this manual.

Accumulated hours are reset to zero (0) if Impact Tool had previous Level III service when returned from last job. Last Service Level applied can be found in previous AIRT created for the tool, by serial number search

Confirmation of Operational and Jarring hours is required from previous job and current returned job.

These hours MUST be recorded in WPTS job entry and MyAdvisor.

In the event that this information is not available then the Fishing Impact Tool is not eligible for Service level II.

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4.01 – R&M Service Level Definitions

MyAdvisor defines the following levels of R&M repair, with equivalent Fishing Impact Tool R&M Service Level

My Advisor R&M Level I = R&M Service Level I for Fishing Impact Tools

- Function Testing, recalibration, cleaning, painting, and tagging
- Basic mechanical /electrical inspection activity and field tests
- No major components replaced or repaired

Follow steps as laid out in T&I PFT for the specific Impact Tool

My Advisor R&M Level II = R&M Service Level II for Fishing Impact Tools

- Routine Maintenance and replacement of up to 50% active components (majorly mechanical repairs)
- Swaps of sub-assemblies, sensors, and oil change
- 6 monthly and 1-year certifications, scheduled maintenance

Follow steps as laid out for R&M Service II in S&R PFT for the specific Impact Tool

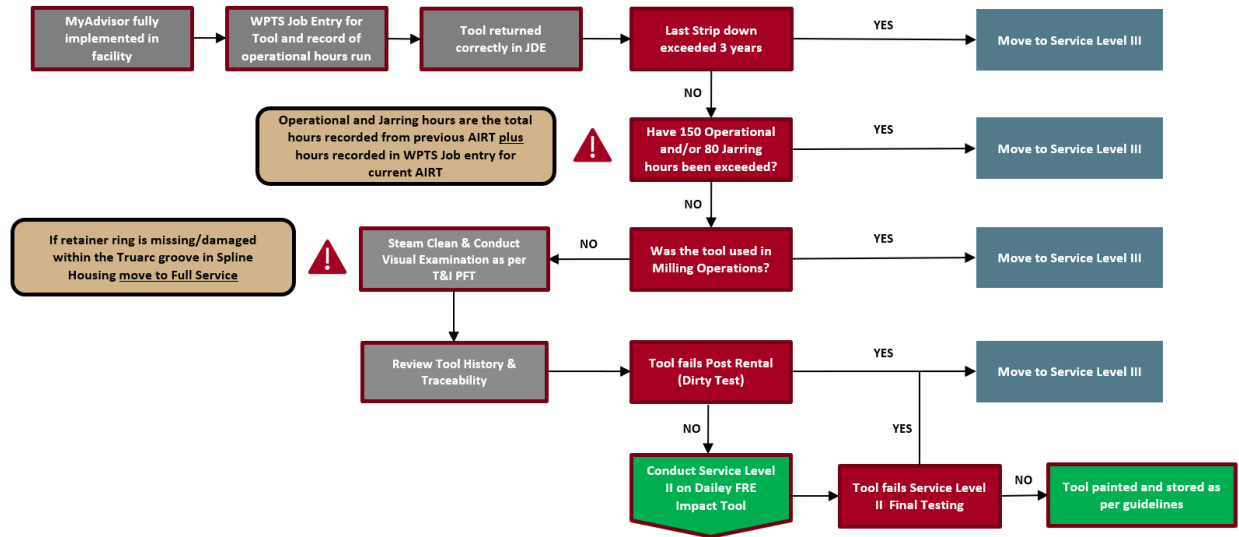
My Advisor R&M Level III = R&M Service Level III for Fishing Impact Tools

- Major mechanical, electrical. Sensor replacements and repairs, major surveys, calibration, and requalification
- 1 Year and 3-year certifications and overhaul repairs
- Replacement of more than 50% of active components, asset recapitalization or scrap disposition

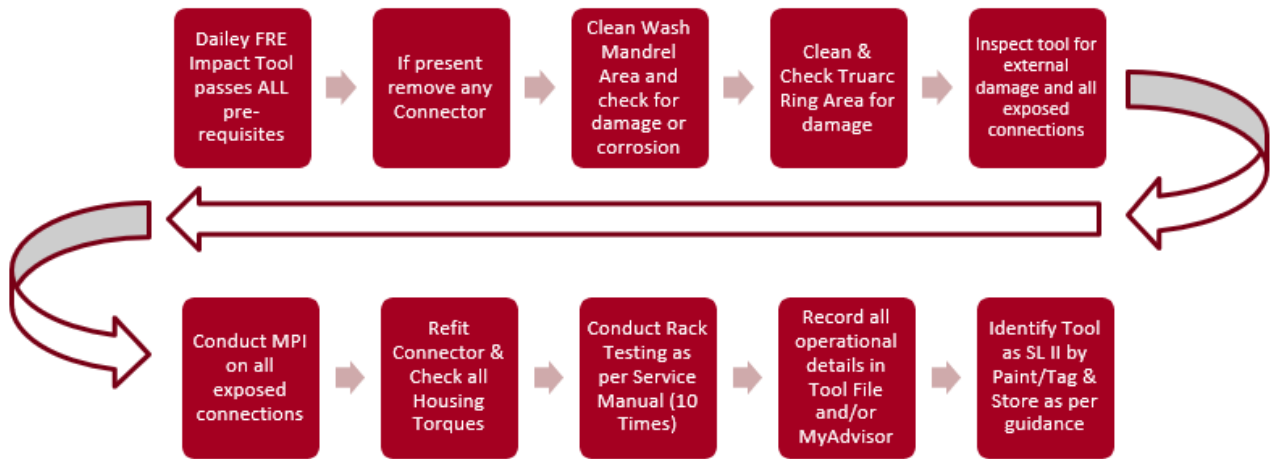
Follow steps as laid out for R&M Service III in S&R PFT for the specific Impact Tool

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4.02 – R&M Service Type Decision Tree



4.03 – Service Level II Process Steps FRE Impact Tools



For **Service Level III** procedure proceed to Chapter 5.0 of the Service manual

For **Service Level II** procedure proceed to Chapter 9.0 of the Service manual

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CHAPTER: 5.00 – R&M SERVICE LEVEL III DISASSEMBLY

 NOTE	NOTE/PROCEDURE
	All repair procedures contained within this service manual can be conducted in either a tong and vise as depicted or a breakout unit.

 NOTE	NOTE
	- If issues are encountered removing Fluid Plugs, please refer to Chapter 13.00 - If issues are encountered removing Wash & Flow Mandrel refer to Chapter 13.00

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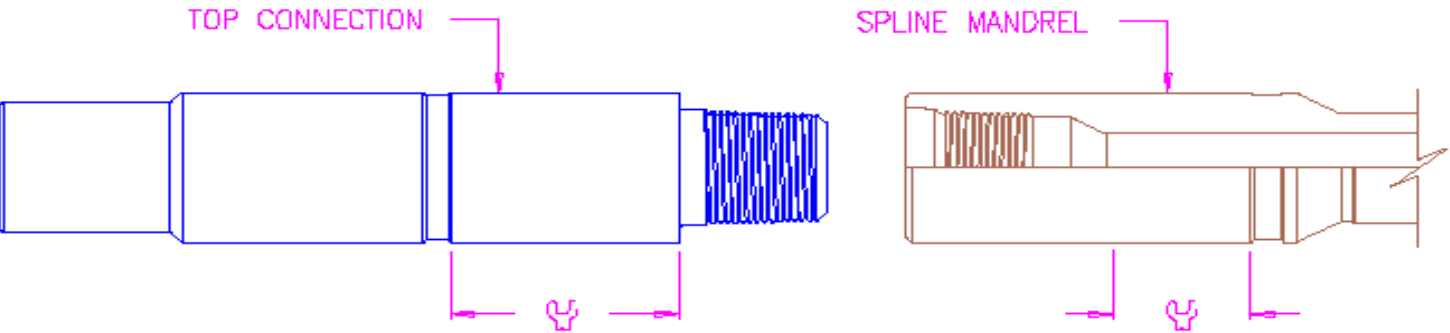
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TOP SECTION

ALL THREADS ARE RIGHT HANDED UNLESS OTHERWISE DESIGNATED. (REFER TO CHART FOR PROPER TORQUE VALUES)

DUE TO EXCESS OPERATIONAL TORQUE SOME OF THE EXTERNAL CONNECTIONS MAY REQUIRE ADDITIONAL TORQUE TO BREAK.



BREAK AND REMOVE THE TOP CONNECTION ON THE 3 3/4 O.D. AND 4 1/4 x 1 15/16 TOOLS ONLY.

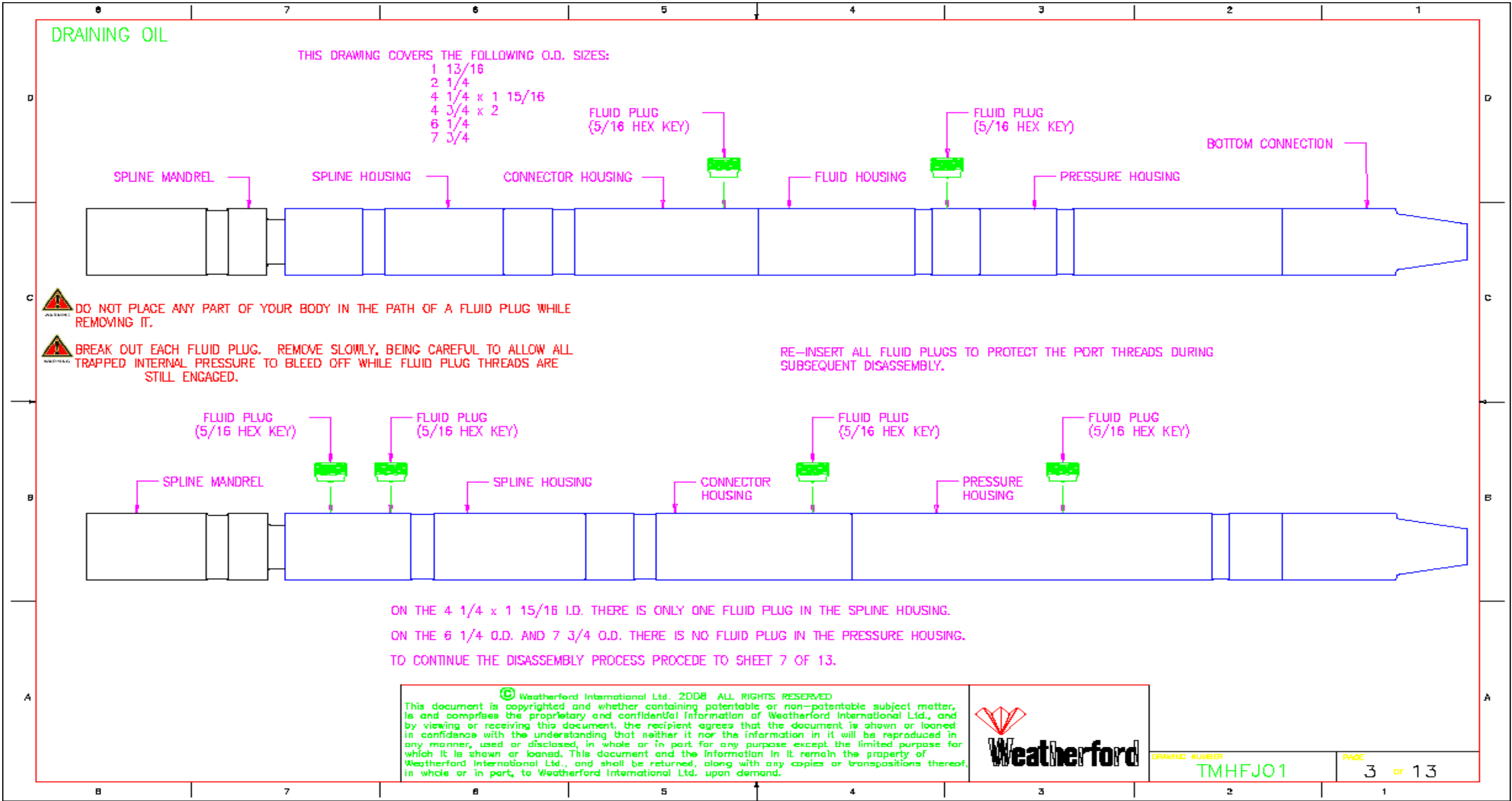
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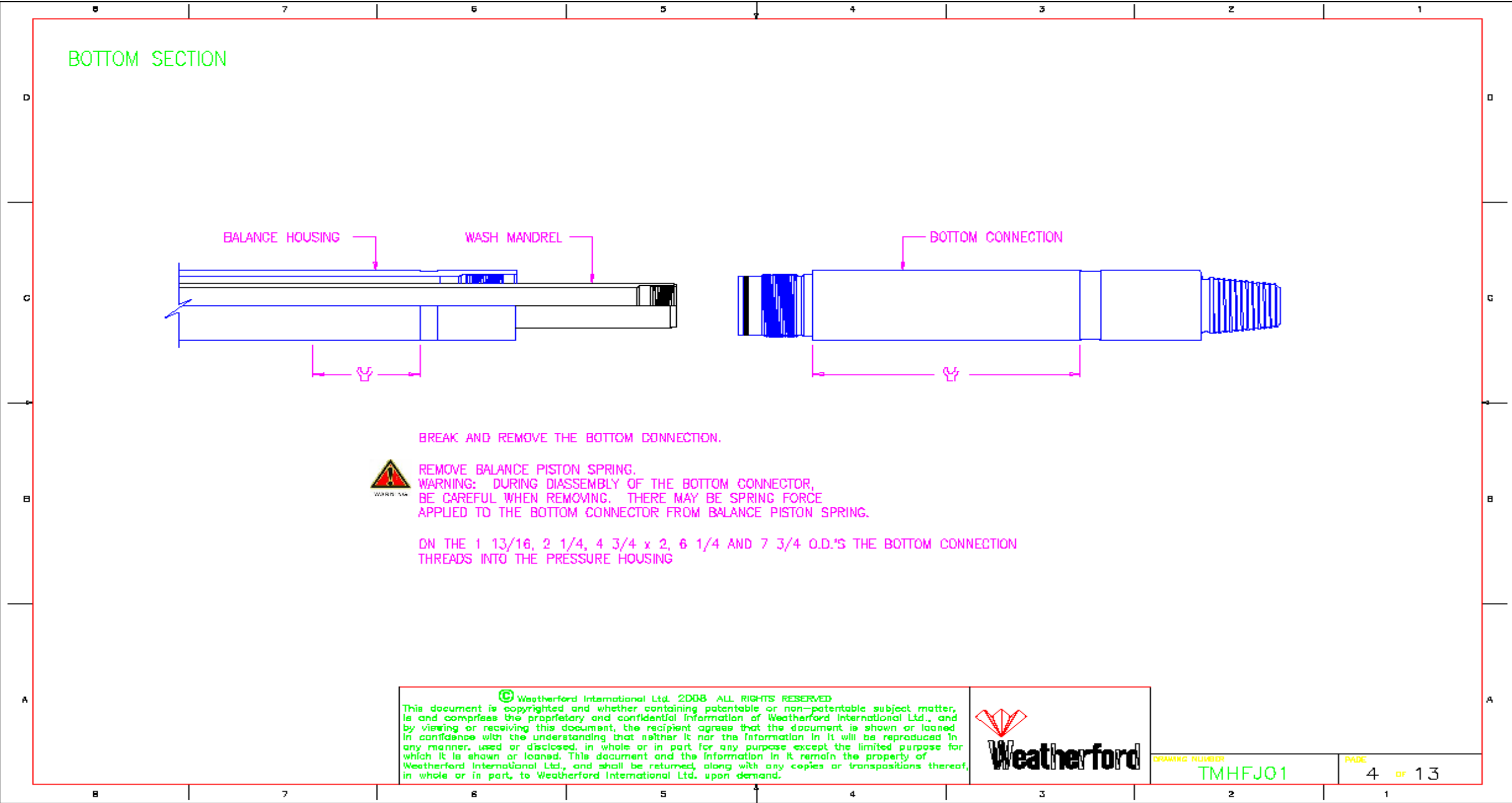
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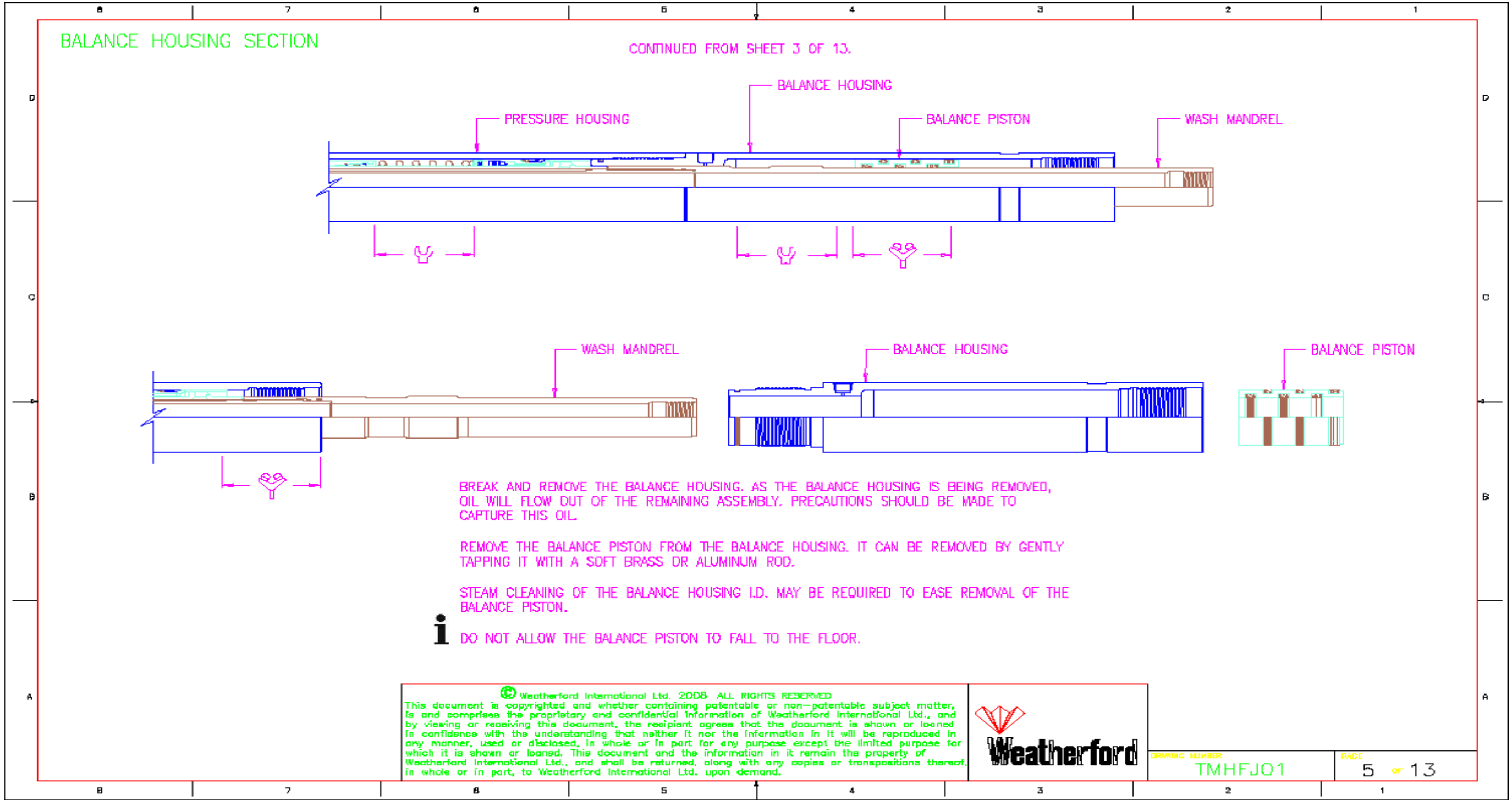
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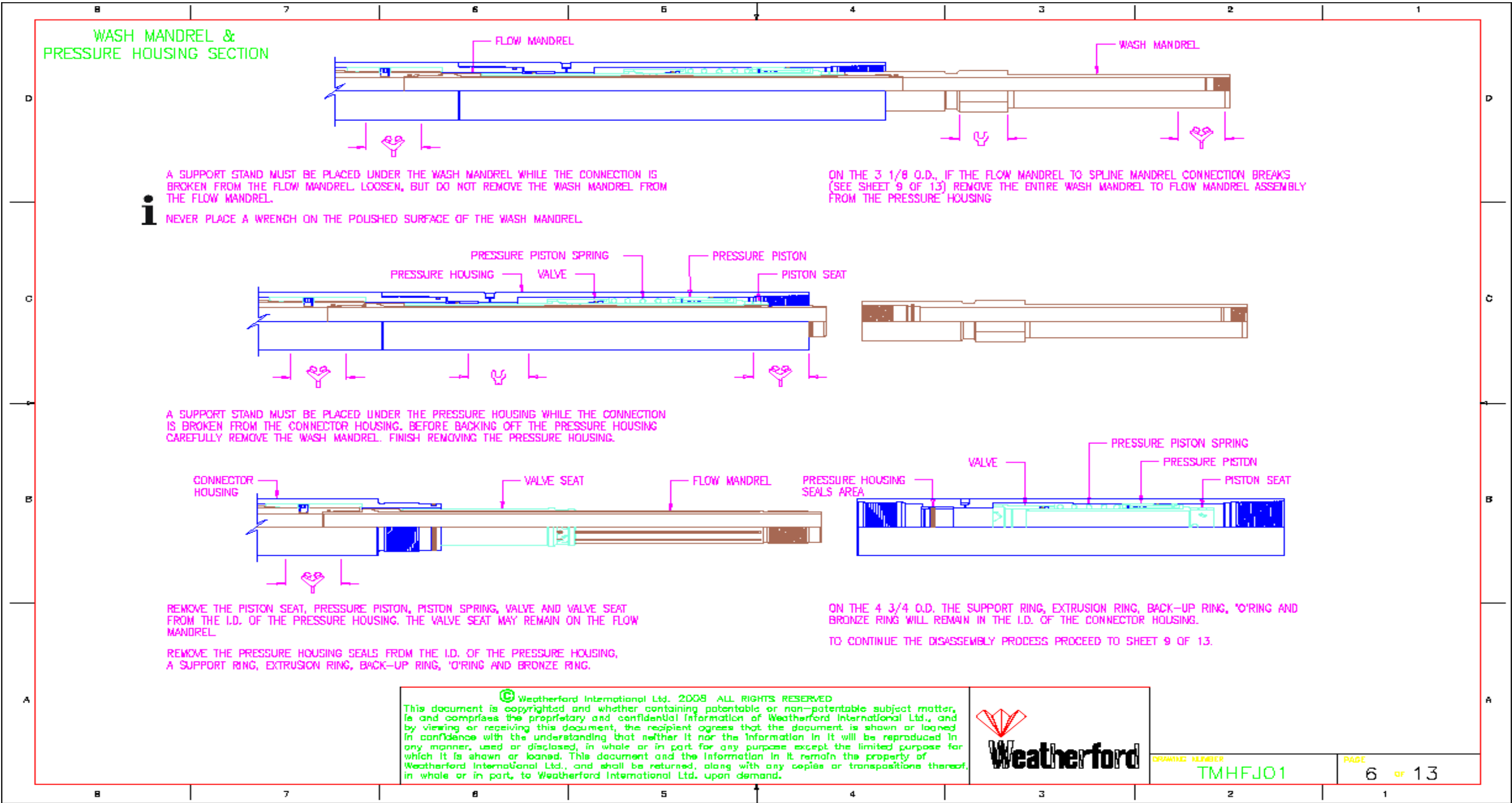
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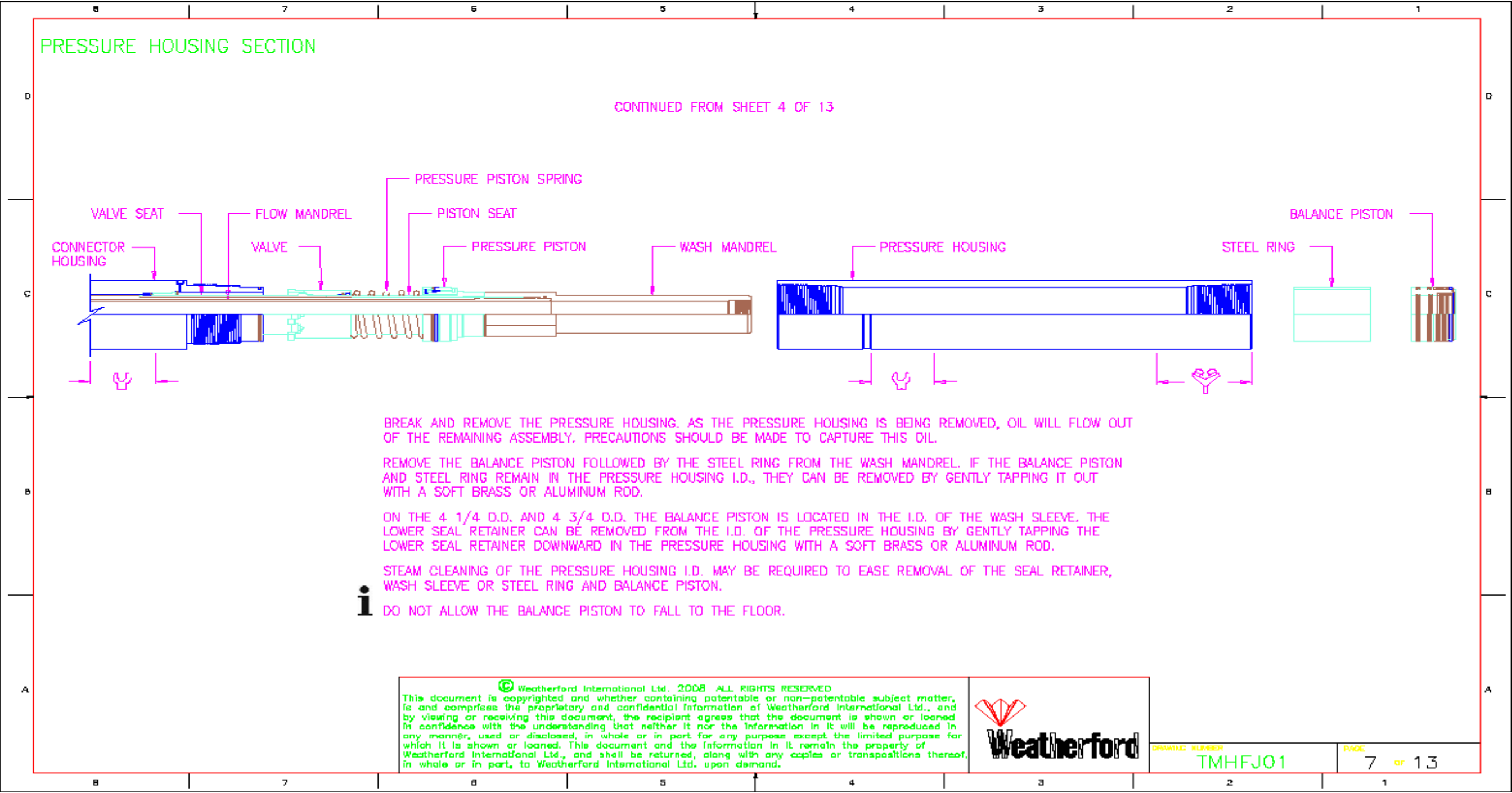
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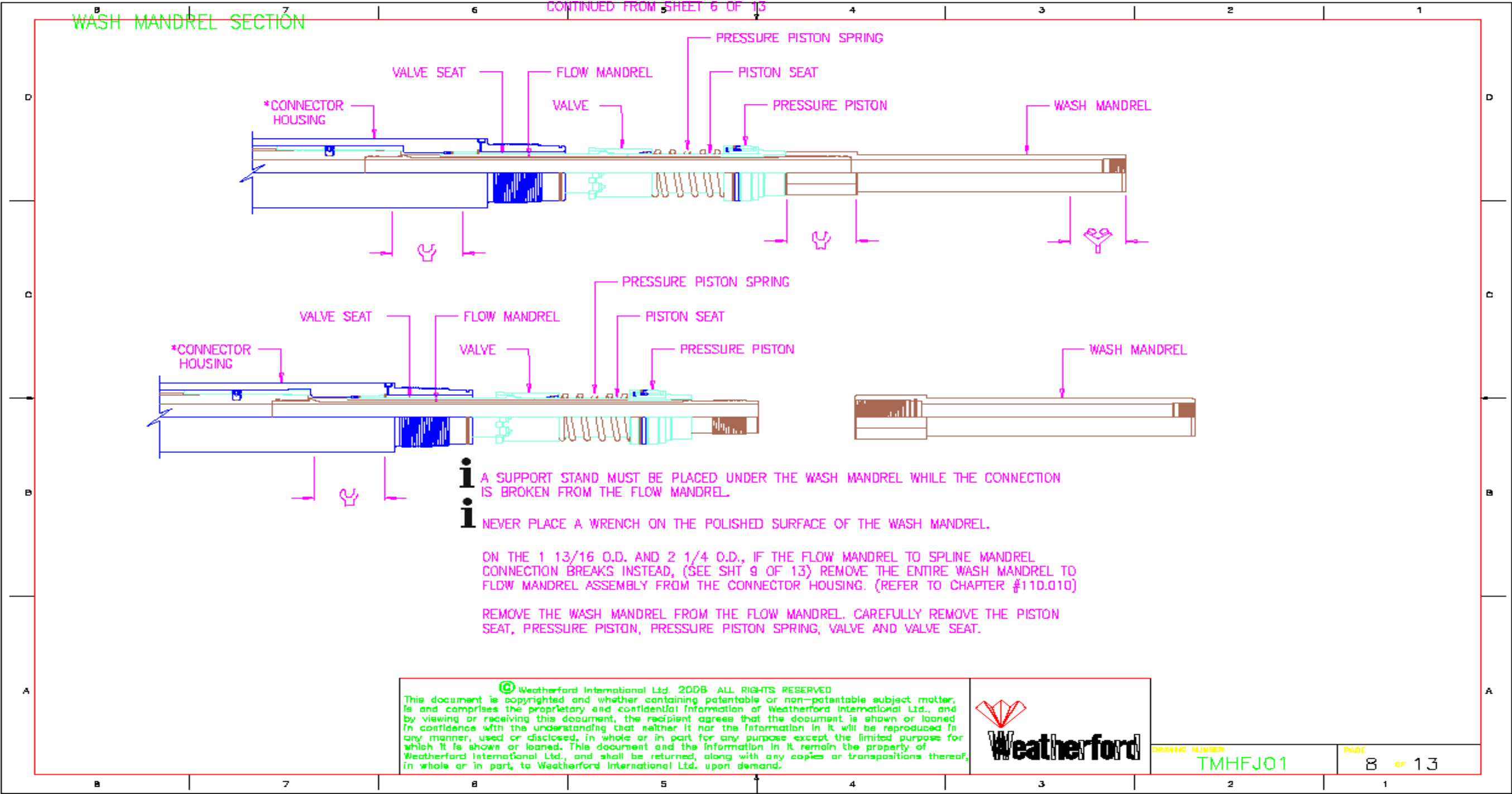
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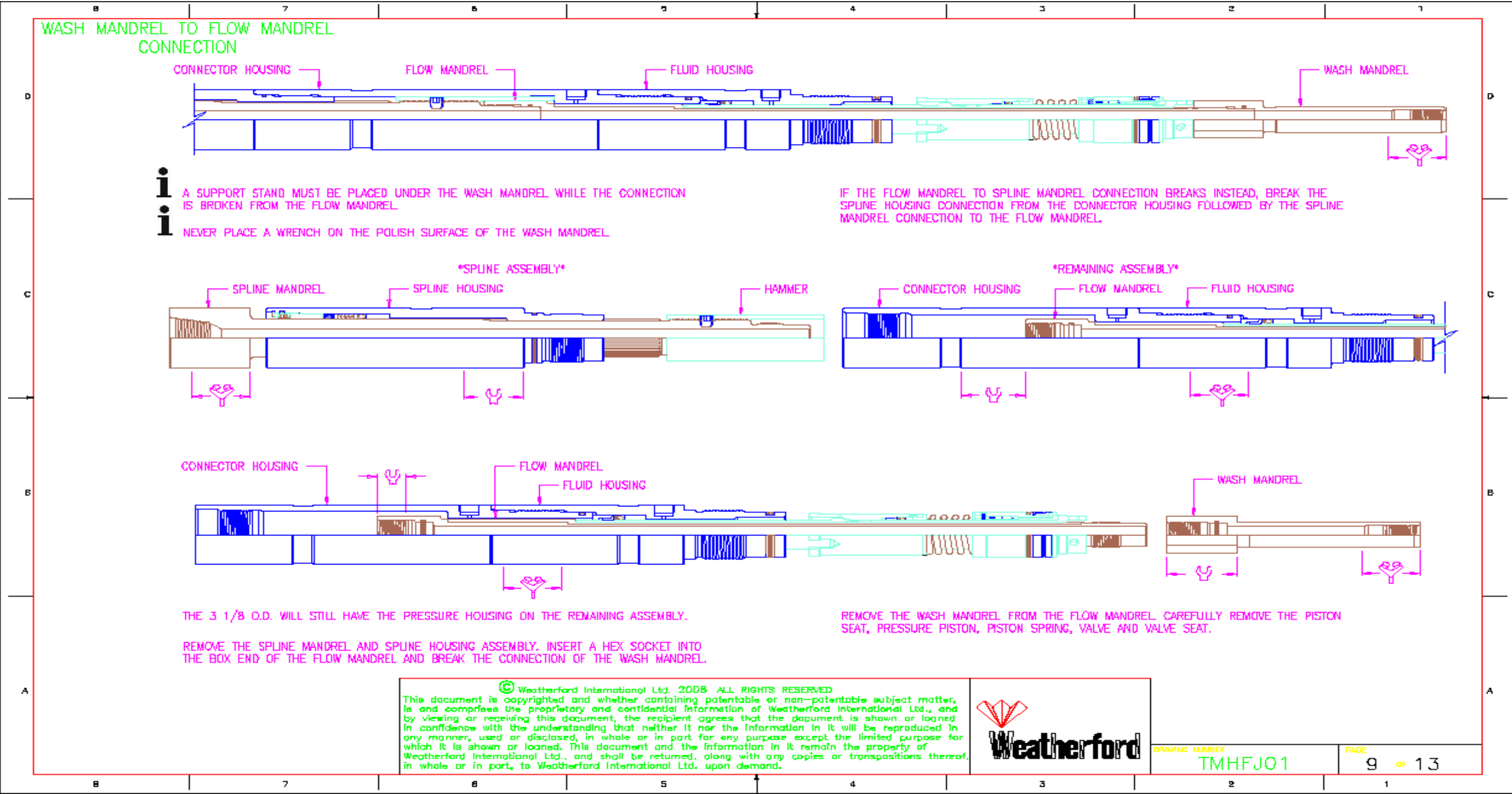
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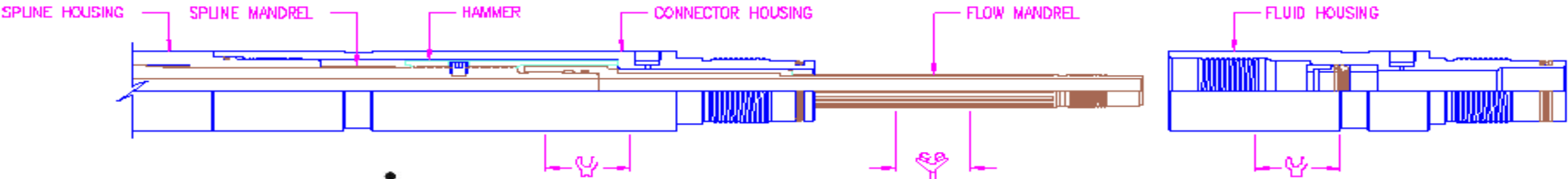


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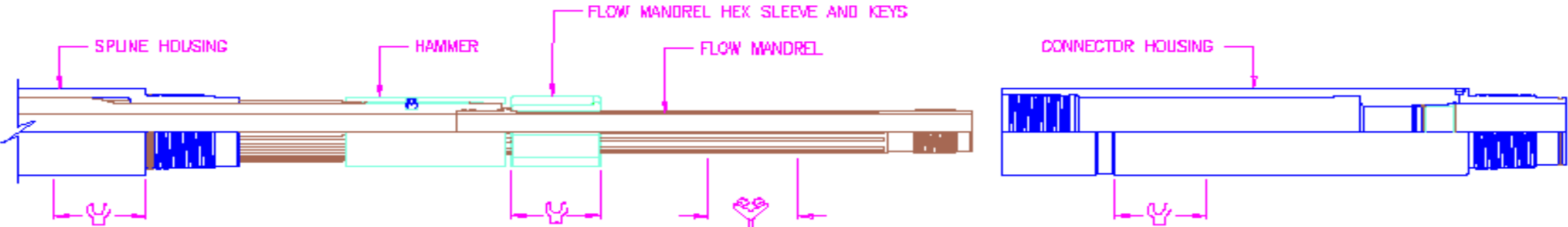


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FLOW MANDREL SECTION



- i** A SUPPORT STAND MUST BE POSITIONED UNDER THE FLOW MANDREL BEFORE THE CONNECTOR HOUSING OR FLUID HOUSING CONNECTION CAN BE BROKEN.
- BREAK AND REMOVE THE CONNECTOR HOUSING OR FLUID HOUSING.
- REMOVE FROM THE I.D. OF THE CONNECTOR HOUSING A TRUARC RING, BEARING RING, "O" RING, BACK-UP RING, EXTRUSION RING AND SUPPORT RING.

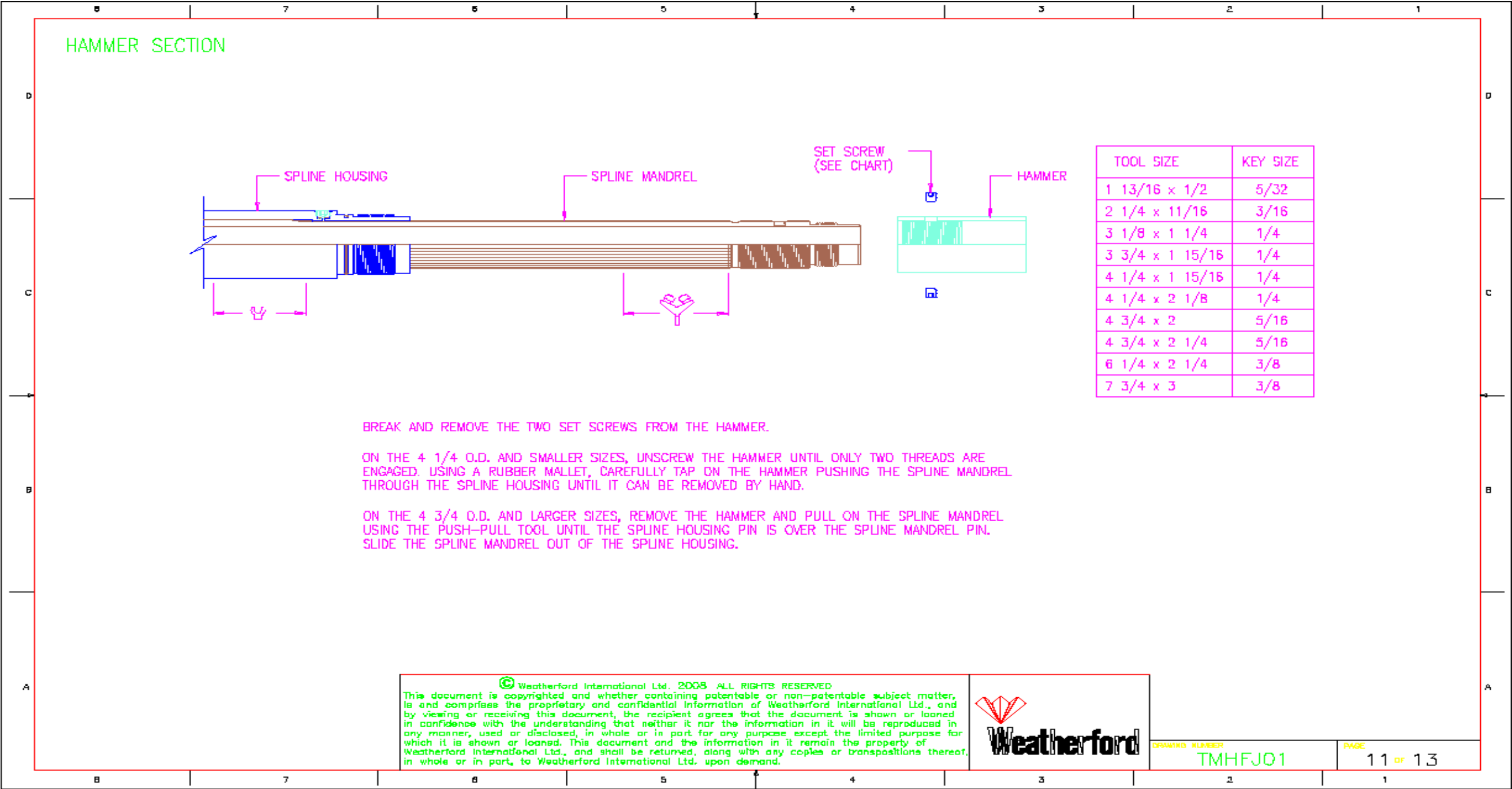


- REMOVE FROM THE I.D. OF THE FLUID HOUSING A SUPPORT RING, EXTRUSION RING, BACK-UP RINGS, "O" RING AND BRONZE RING.
- INSTALL THE FLOW MANDREL HEX SLEEVE WITH KEYS ONTO THE FLOW MANDREL.
- USING A HEX WRENCH, BREAK AND REMOVE THE FLOW MANDREL.

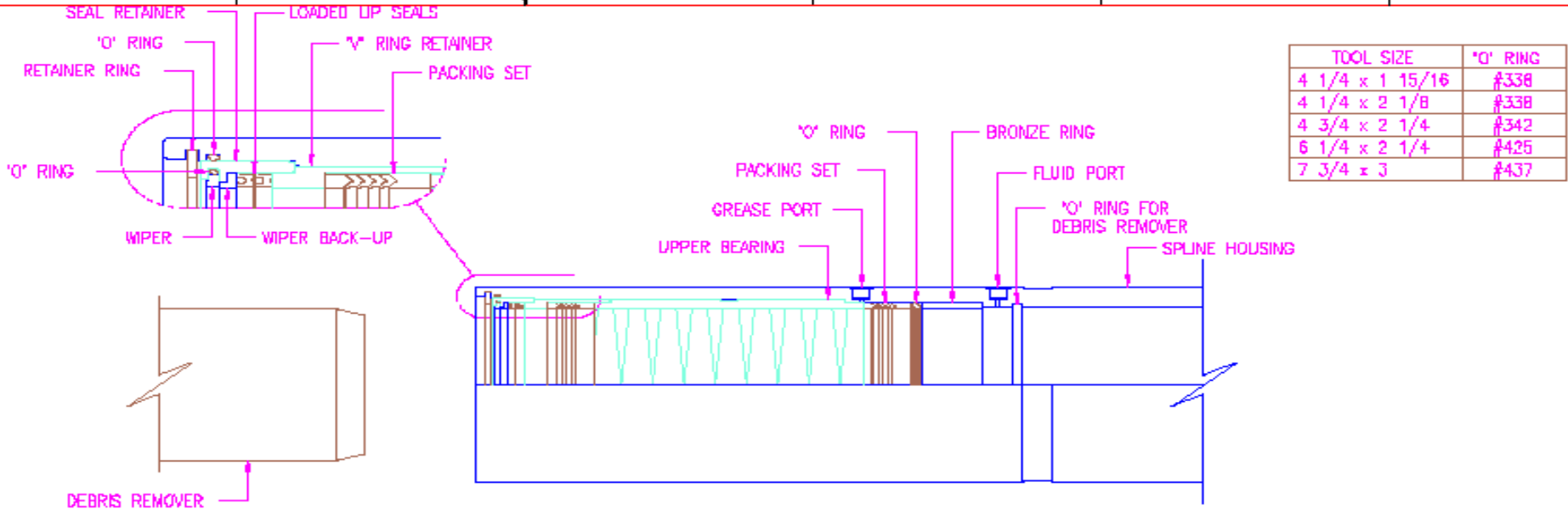
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DEBRIS SECTION
4 1/4 O.D. AND LARGER



TOOL SIZE	*O' RING
4 1/4 x 1 15/16	#338
4 1/4 x 2 1/8	#338
4 3/4 x 2 1/4	#342
6 1/4 x 2 1/4	#425
7 3/4 x 3	#437



PLACE THE SPLINE HOUSING IN THE FLOOR VISE.
REMOVE THE RETAINER RING FROM THE SPLINE HOUSING.
ON THE 4 3/4 x 2 I.D., 6 1/4 O.D. AND 7 3/4 O.D. REMOVE THE FLUID PLUG FROM THE GREASE PORT AND ATTACH A FILLER VALVE. THE FLUID PLUG IN THE FLUID PORT SHOULD NOT BE REMOVED.
ON THE 4 1/4 x 15/16 I.D., 4 1/4 x 2 1/8 I.D. AND 4 3/4 x 2 1/4 I.D. REMOVE THE SINGLE FLUID PLUG ON THE SPLINE HOUSING AND ATTACH THE FILLER VALVE TO THE FLUID PORT.
INSERT THE DEBRIS REMOVER INTO THE SPLINE HOUSING. ATTACH THE PRESSURE LINE FROM THE FILLER TANK TO THE FILLER VALVE AND SLOWLY PUMP OIL INTO THE SPLINE HOUSING.
IF ANY OF THE DEBRIS SECTION IS NOT EXTRACTED, REMOVE THE DEBRIS REMOVER. INSTALL AN *O' RING (SEE CHART FOR SIZE) IN THE GROOVE JUST BELOW THE FLUID PORT (NOT APPLICABLE ON THE 4 3/4 x 2 I.D.), AND INSTALL A FLUID PLUG IN THE GREASE PORT.
ON THE 4 1/4 x 1 15/16 I.D. THE FOLLOWING PARTS WILL BE REMOVED FROM THE SPLINE HOUSING: THE SEAL RETAINER, THE UPPER PACKING SPACER, AN *O'RING, THE BRONZE RING, AN *O'RING AND ANOTHER BRONZE RING. REMOVE AN *O'RING FROM THE GROOVE LOCATED ABOVE THE SEAL RETAINER LOCATION (SEE SCALED DETAIL). ALSO, REMOVE THE RYTON RING AND LOADED LIP SEALS FROM THE SEAL RETAINER.

ON THE 4 1/4 x 2 1/8 I.D. AND 4 3/4 x 2 1/4 I.D. THE FOLLOWING PARTS WILL BE REMOVED FROM THE SPLINE HOUSING: THE SEAL RETAINER, THE UPPER PACKING SPACER, THE MESH RING, THE PACKING SET, AN *O'RING AND A BRONZE RING. REMOVE AN *O'RING FROM THE GROOVE LOCATED ABOVE THE SEAL RETAINER LOCATION (SEE SCALED DETAIL). ALSO, REMOVE THE WIPER OR RYTON RING AND LOADED LIP SEALS FROM THE SEAL RETAINER.
ON THE 4 3/4 x 2 I.D., 6 1/4 O.D. AND 7 3/4 O.D. THE FOLLOWING PARTS WILL BE REMOVED FROM THE SPLINE HOUSING: THE SEAL RETAINER, THE UPPER PACKING SET, THE LONG UPPER BEARING, THE UPPER PACKING SET, AN *O'RING AND A BRONZE RING. REMOVE AN *O'RING FROM THE GROOVE LOCATED ABOVE THE SEAL RETAINER LOCATION (SEE SCALED DETAIL). REMOVE THE WIPER RING, *O'RING, BACK-UP WIPER AND LOADED LIP SEALS FROM THE SEAL RETAINER. ALSO, REMOVE FROM THE V-RING RETAINER THE UPPER PACKING SET.
ADDITIONAL DISASSEMBLIES
REMOVE ALL *O'RINGS, BACK-UP RINGS AND LOADED LIP SEALS IN OR ON ALL HOUSINGS OR MANDRELS.
REMOVE ALL FLUID PLUG(S) FROM HOUSINGS.
REMOVE THE *O'RINGS, BACK-UP RINGS AND LOADED LIP SEALS FROM THE BALANCE PISTON O.D. AND I.D..
DISCARD THE RYTON RING, THE WIPER, THE WIPER BACK-UP, ALL THE *O'RINGS, THE BACK-UP RINGS, LOADED LIP SEALS, THE PACKINGS, THE MESH RINGS AND THE FLUID PLUGS.



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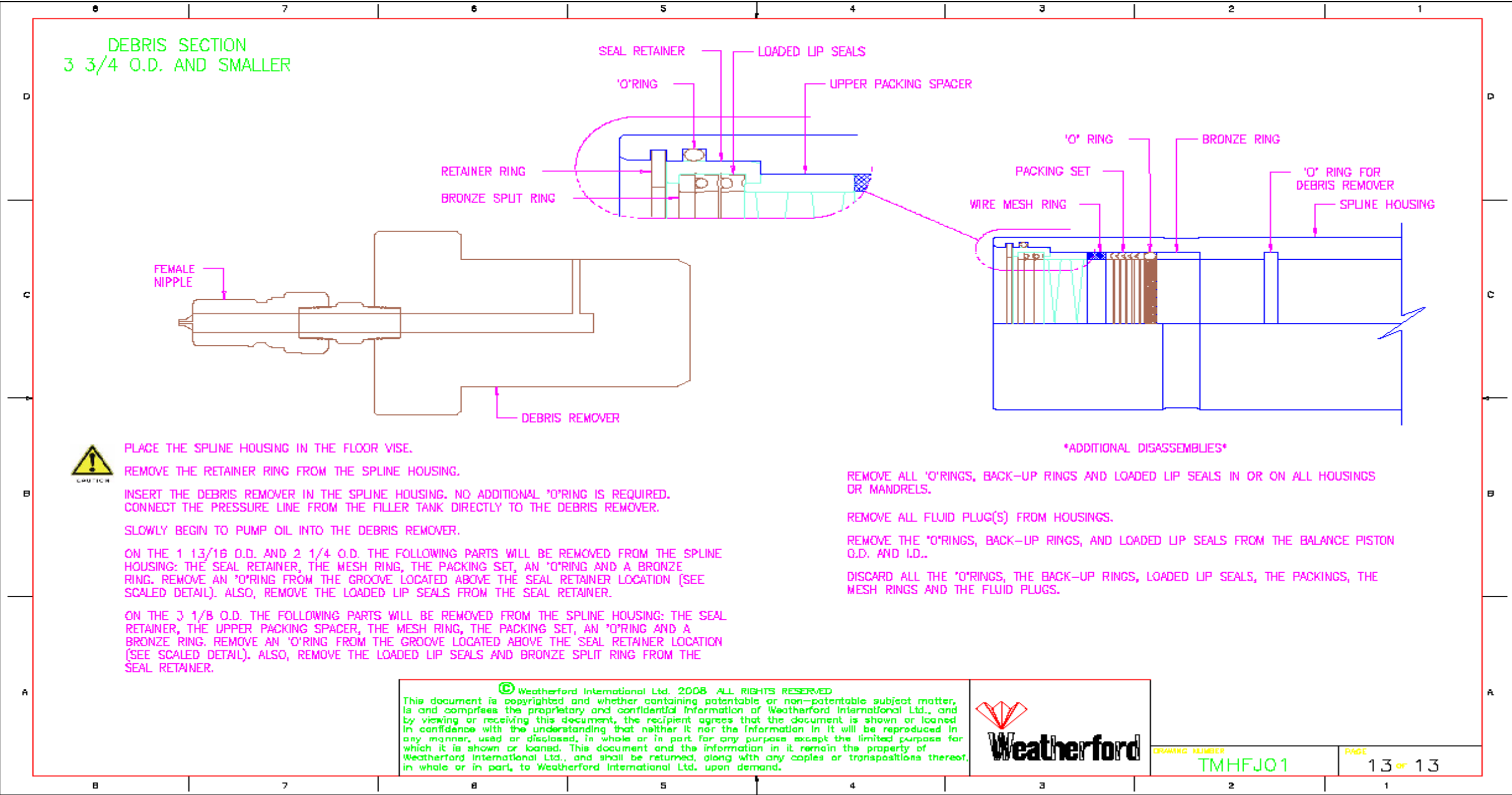
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CHAPTER: 6.00 – R&M SERVICE LEVEL III PREASSEMBLY

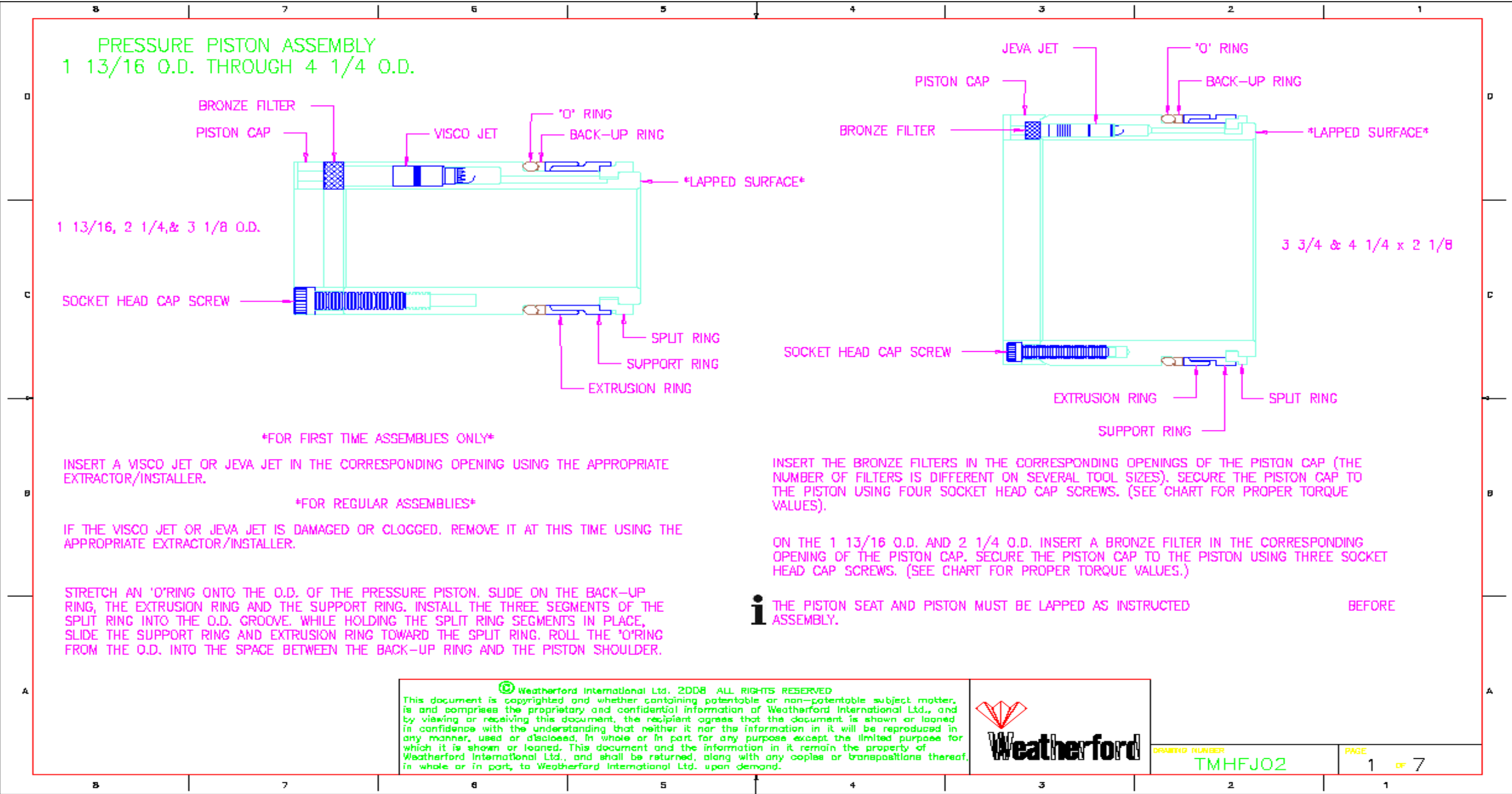
 NOTE	NOTE
	- If issues are encountered removing/installing Visco/Jeva Jets, please refer to Chapter 13.00 - Lapping procedure can also be found in Chapter 13.00

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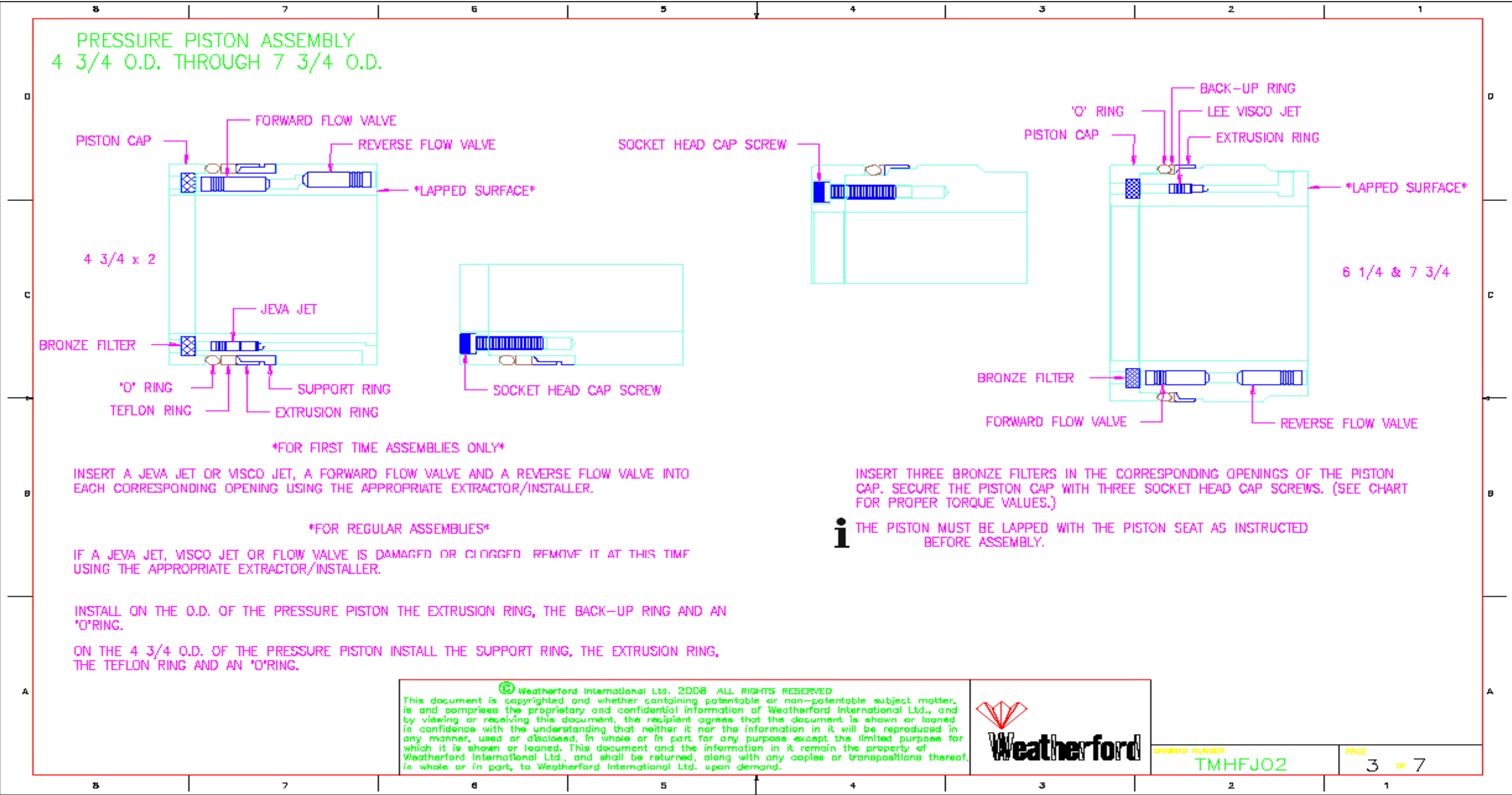
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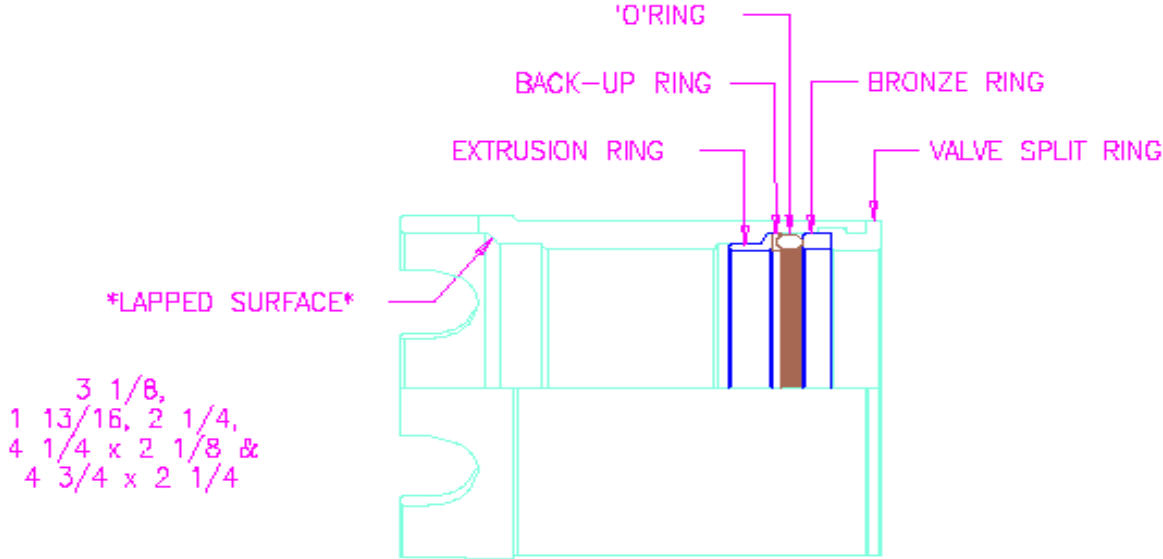


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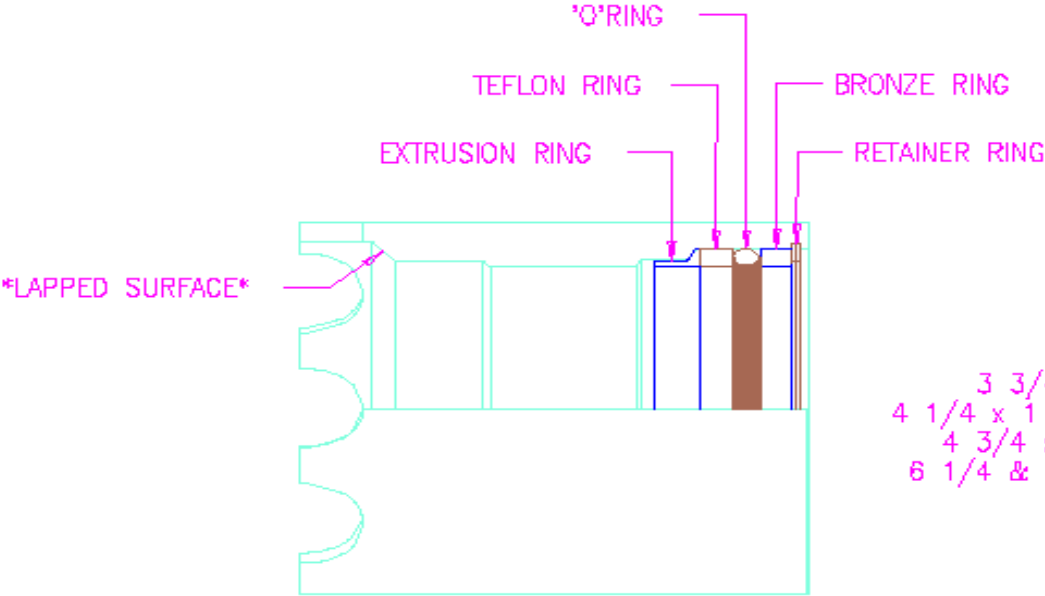
VALVE ASSEMBLY



i THE VALVE MUST BE LAPPED AS INSTRUCTED BEFORE ASSEMBLY.

IN THE I.D. OF THE VALVE INSTALL THE EXTRUSION RING, THE BACK-UP RING AND THE BRONZE RING. INSTALL THE THREE SEGMENTS OF THE SPLIT RING INTO THE I.D. GROOVE. WHILE HOLDING THE SPLIT RING SEGMENTS IN PLACE, SLIDE THE BRONZE RING TOWARD THE SPLIT RING. INSERT AN 'O' RING INTO THE SPACE BETWEEN THE BACK-UP RING AND THE BRONZE RING.

IN THE I.D. OF THE 3 1/8 O.D. VALVE INSTALL THE EXTRUSION RING, THE TEFLON RING AND THE BRONZE RING. INSTALL THE THREE SEGMENTS OF THE SPLIT RING INTO THE I.D. GROOVE. WHILE HOLDING THE SPLIT RING SEGMENTS IN PLACE, SLIDE THE BRONZE RING TOWARD THE SPLIT RING. INSERT AN 'O'RING INTO THE SPACE BETWEEN THE TEFLON RING AND THE BRONZE RING.



IN THE I.D. OF THE VALVE INSTALL THE EXTRUSION RING, THE TEFLON RING, AN 'O'RING AND THE BRONZE RING. SECURE THEM WITH A RETAINER RING.

ON THE 6 1/4 AND 7 3/4 THERE IS A BACK-UP RING LOCATED BETWEEN THE EXTRUSION RING AND THE 'O'RING.

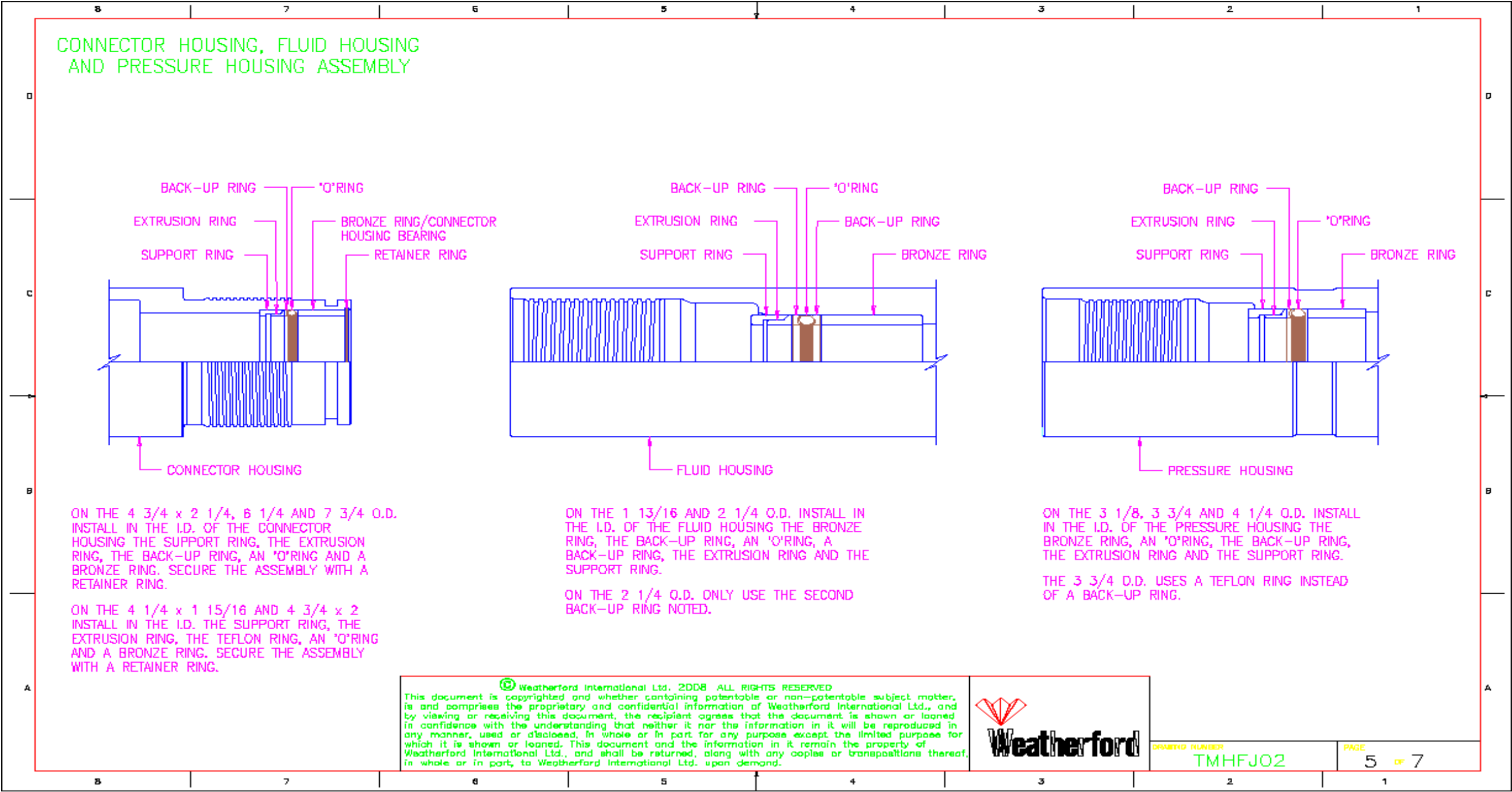
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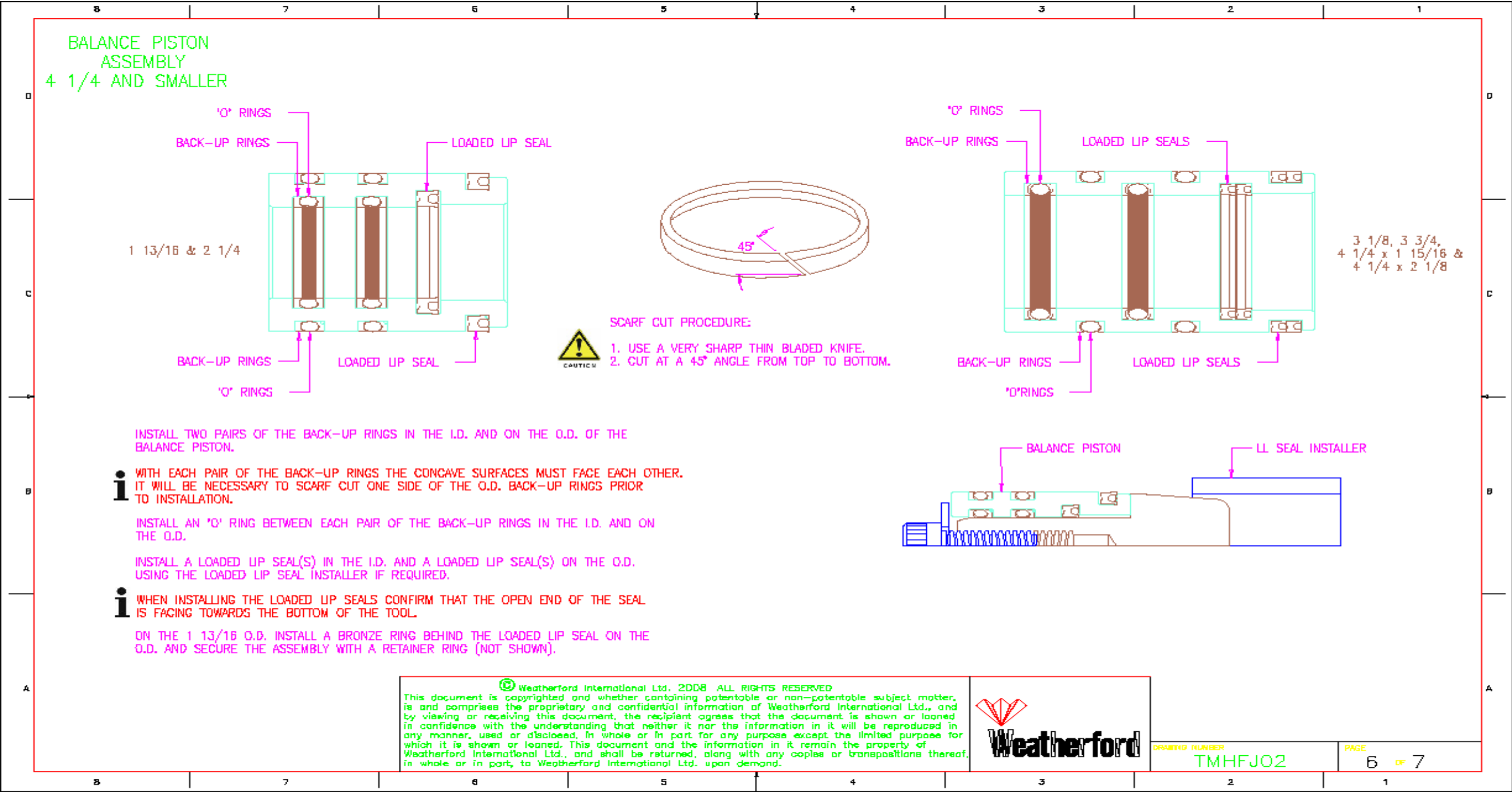
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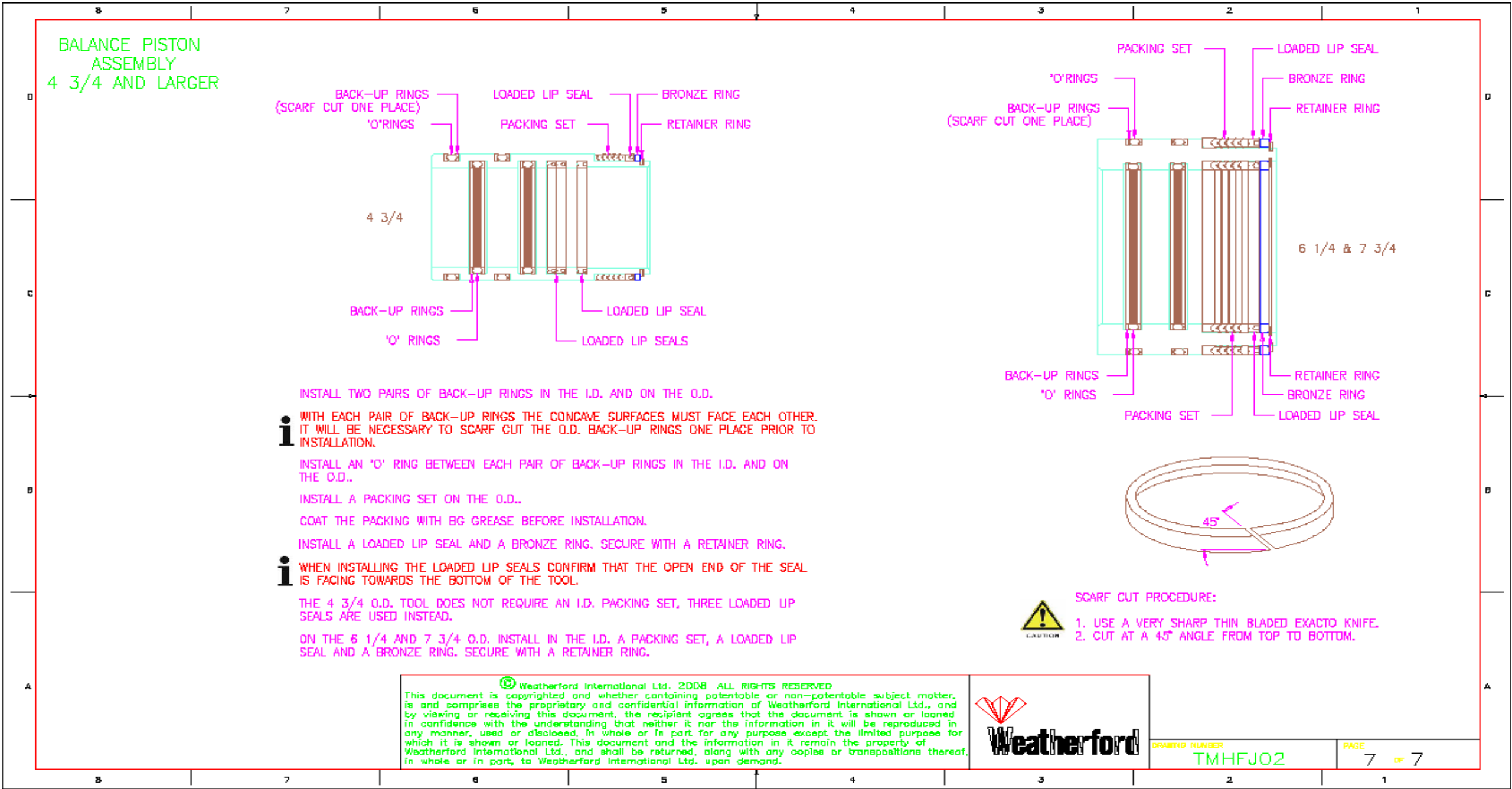
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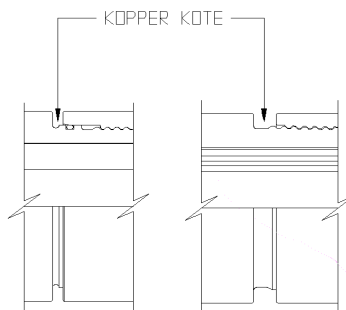
CHAPTER: 7.00 – R&M SERVICE LEVEL III ASSEMBLY

7.010 – Assembly Procedure

 NOTE	NOTE	
	During jar assembly, the environment must be kept as clean as possible. No cloth rags are permitted.	
	<u>Use only lint free paper towels</u>, p/n c025000. These towels are <u>not</u> to be used to wipe any part.	

Hydraulic oil should be used for lubrication of all threaded connections and seal areas.

Apply a thin film of copper base thread lubricant (Koper Kote) to all outer connection shoulders **just prior** to complete make-up. This will prevent shoulder galling. Do not allow the Koper Kote to contaminate the fluid wetting areas of all parts.



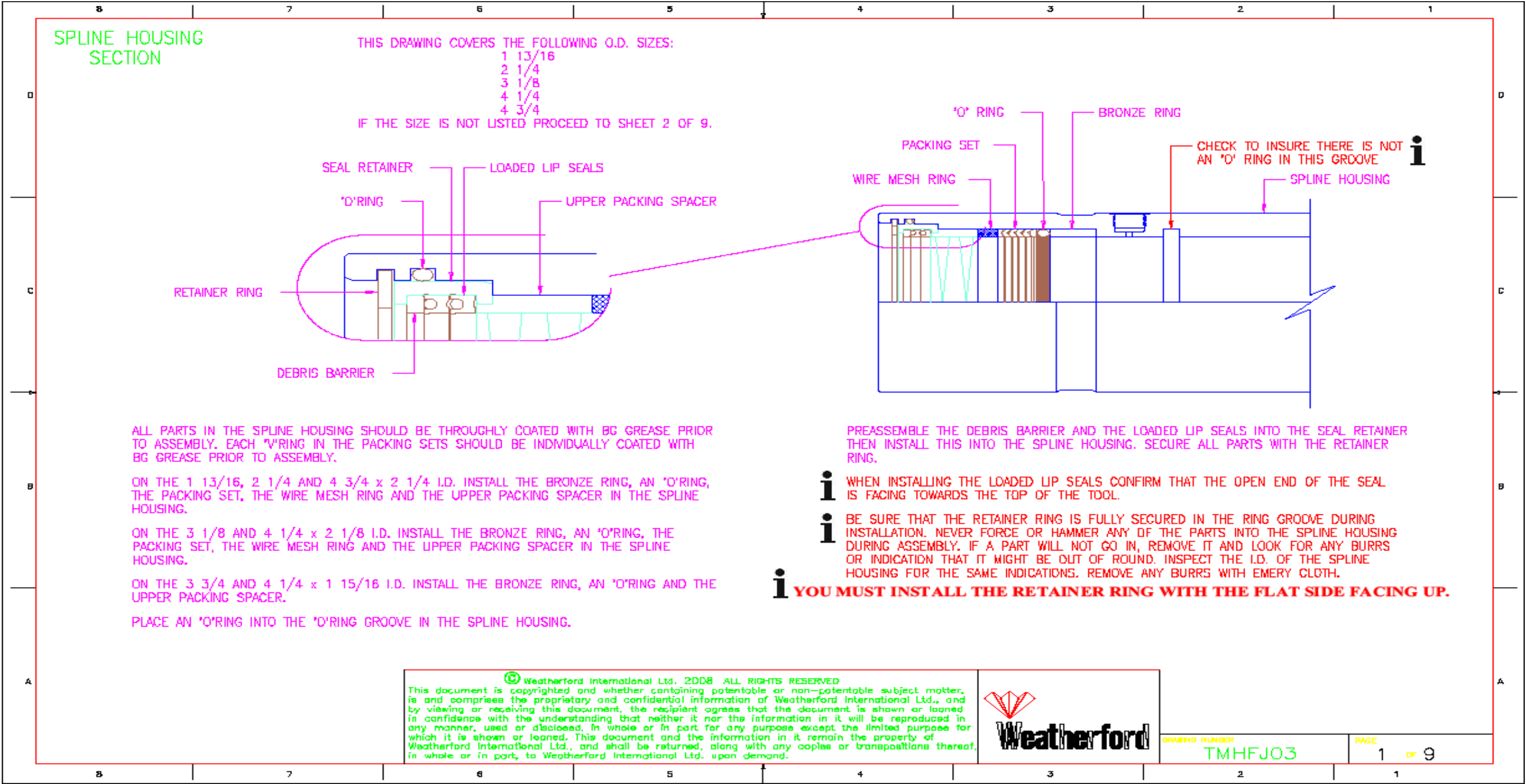
Check all threads for burrs, and polish if necessary. Check all shoulders. If rework is necessary, contact the Weatherford Representative. It is good practice to trial fit any of the internal parts, which may have questionable, wear, prior to beginning the normal re-assembly procedures. Most all of the internal parts should maintain very close fits.

 WARNING	WARNING	
	Required assembly drawings must be used during repair.	

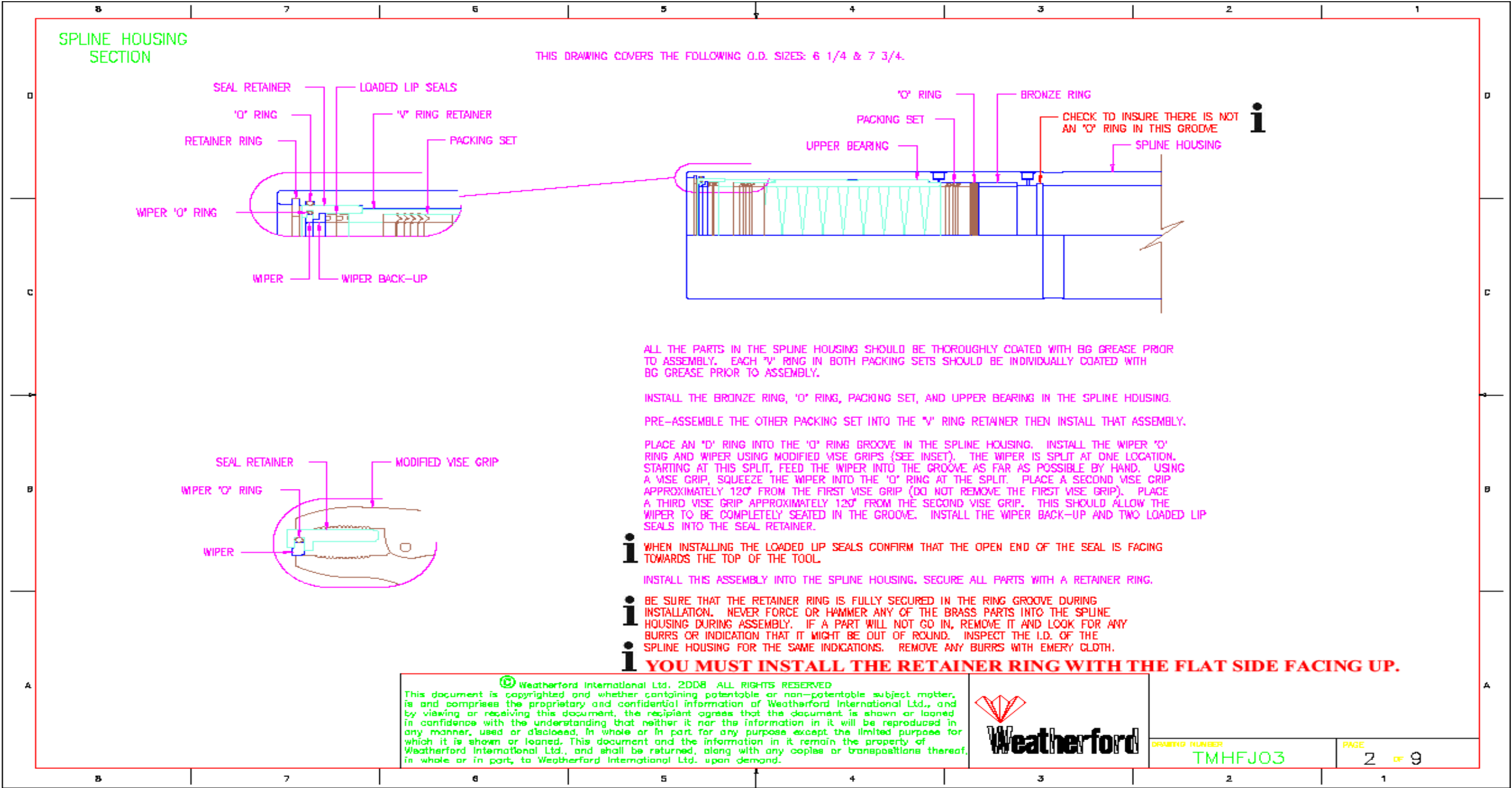
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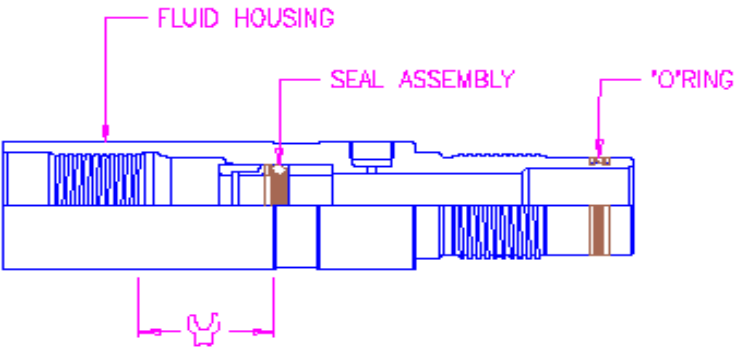
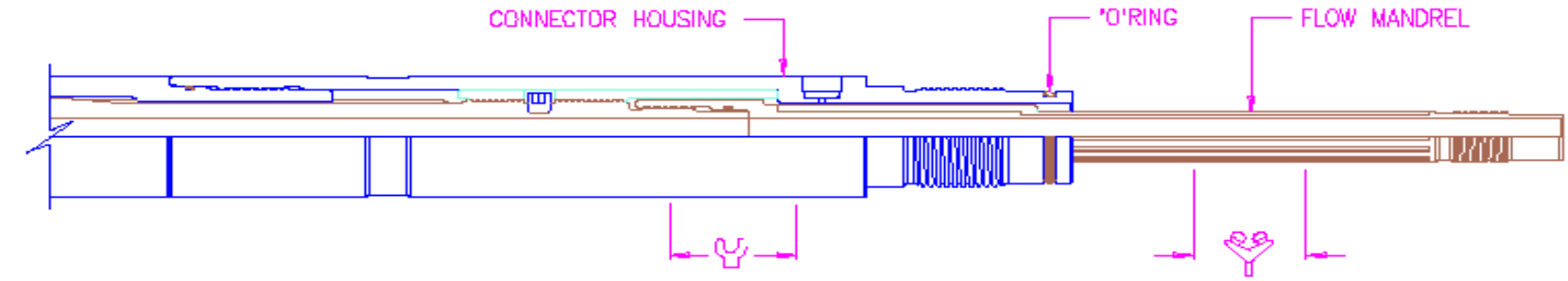
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FLUID HOUSING SECTION

THIS DRAWING COVERS O.D. SIZES: 1 13/16 AND 2 1/4



ON THE 1 13/16 O.D. FLUID HOUSING PIN END INSTALL ONE BACK-UP RING WITH THE CONCAVE SURFACE FACING DOWNWARD FOLLOWED BY AN 'O'RING. IT MAY BE NECESSARY TO SCARF CUT ONE SIDE OF THE O.D. ON THE BACK-UP RING PRIOR TO INSTALLATION.

ON THE 2 1/4 O.D. FLUID HOUSING PIN END INSTALL TWO BACK-UP RINGS WITH THE CONCAVE SURFACES FACING EACH OTHER. IT MAY BE NECESSARY TO SCARF CUT ONE SIDE OF THE O.D. ON THE BACK-UP RINGS PRIOR TO INSTALLATION. INSTALL AN 'O'RING IN BETWEEN THE BACK-UP RINGS.

LUBRICATE THE 'O'RING AND THREADS ON THE CONNECTOR HOUSING PIN END WITH HYDRAULIC OIL.

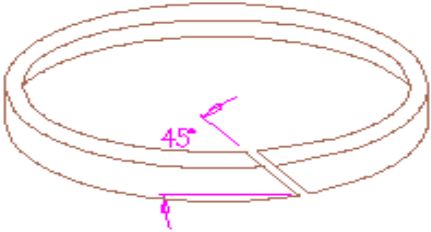
LUBRICATE THE I.D. SEAL ASSEMBLY OF THE FLUID HOUSING WITH HYDRAULIC OIL.

CAREFULLY POSITION THE FLUID HOUSING ON A STAND SO THAT IT IS LEVEL WITH THE FLOW MANDREL AND SLOWLY SLIDE THE FLUID HOUSING ON THE FLOW MANDREL BY HAND.

i CARE SHOULD BE TAKEN DURING THIS PROCEDURE TO ELIMINATE THE CHANCE OF CUTTING OR DAMAGING A SEAL OR 'O' RING.

THREAD THE FLUID HOUSING ONTO THE CONNECTOR HOUSING PIN UNTIL THE 'O'RING OF THE CONNECTOR HOUSING PIN IS ENGAGED. AS THE SHOULDERS NEAR, POSITION THE FLUID PORT SO THAT IT POINTS UP. APPLY KOPPER KOTE (SEE CHAPTER #60.010) TO SHOULDERS PRIOR TO FINAL MAKE-UP. (REFER TO TORQUE CHART FOR PROPER VALUES).

i DO NOT ALLOW KOPPER KOTE TO CONTAMINATE THE FLUID WETTED PARTS.



SCARF CUT PROCEDURE:



1. USE A VERY SHARP THIN BLADED KNIFE.
2. CUT AT A 45° ANGLE FROM TOP TO BOTTOM.

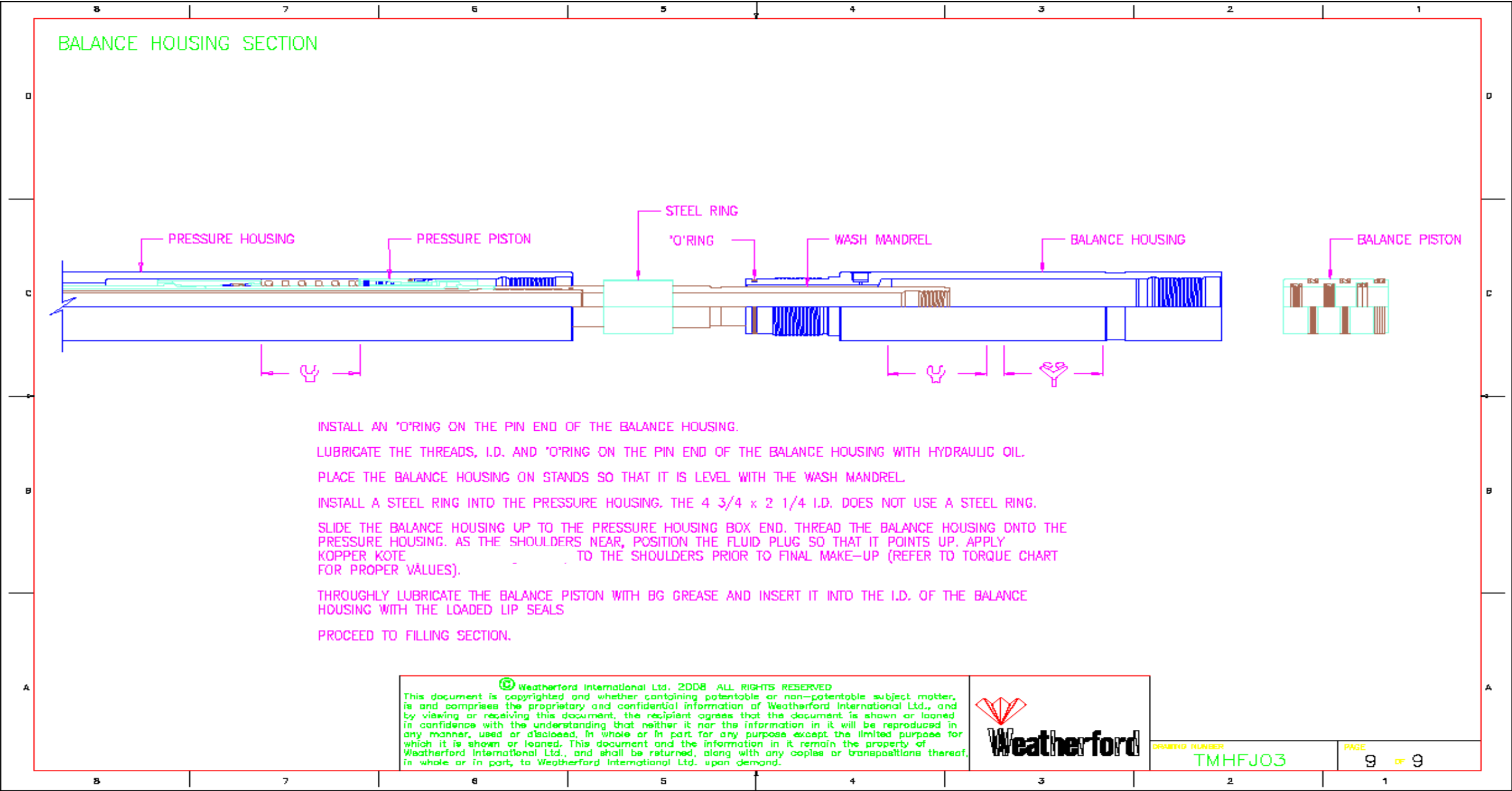
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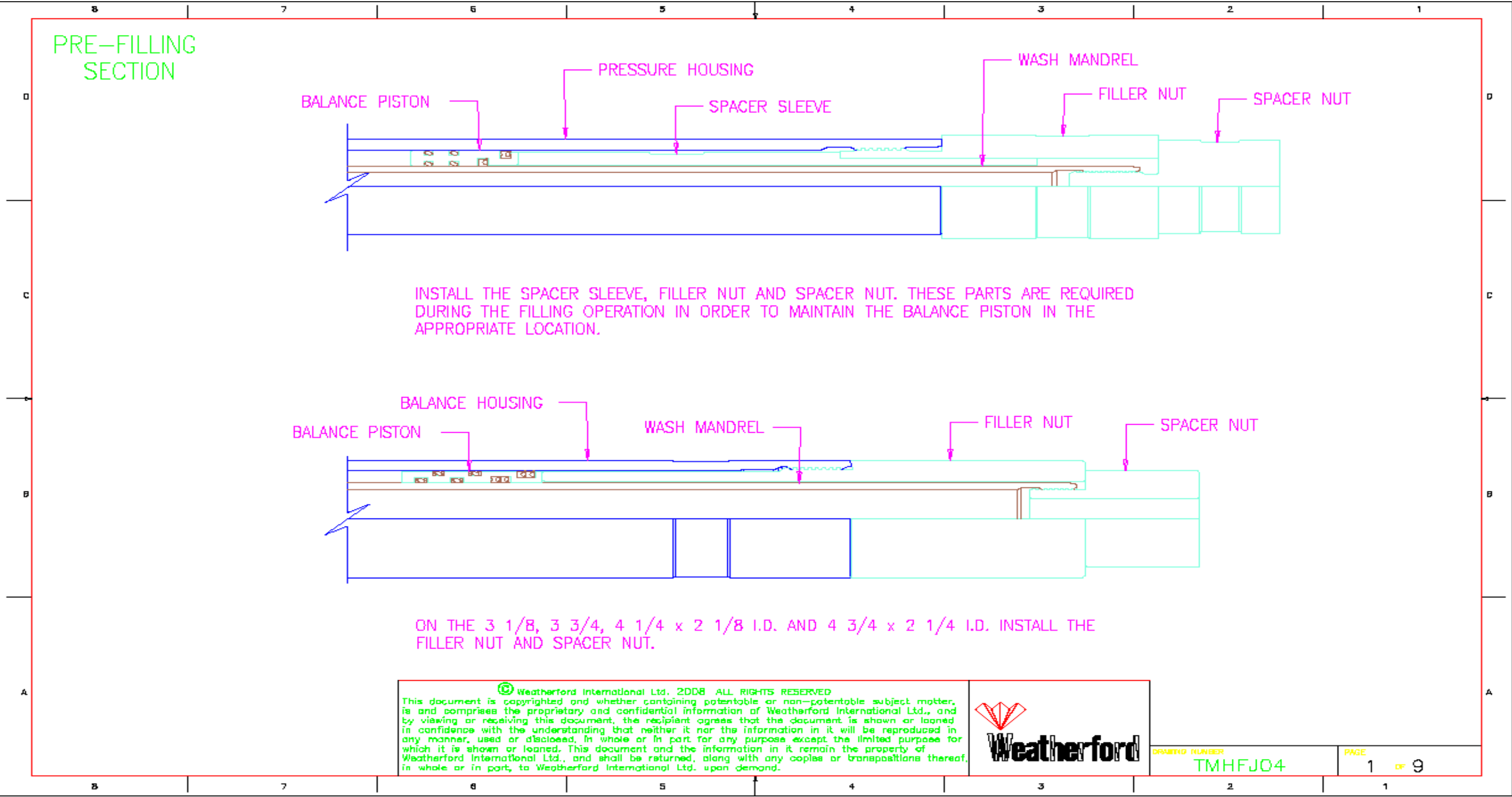


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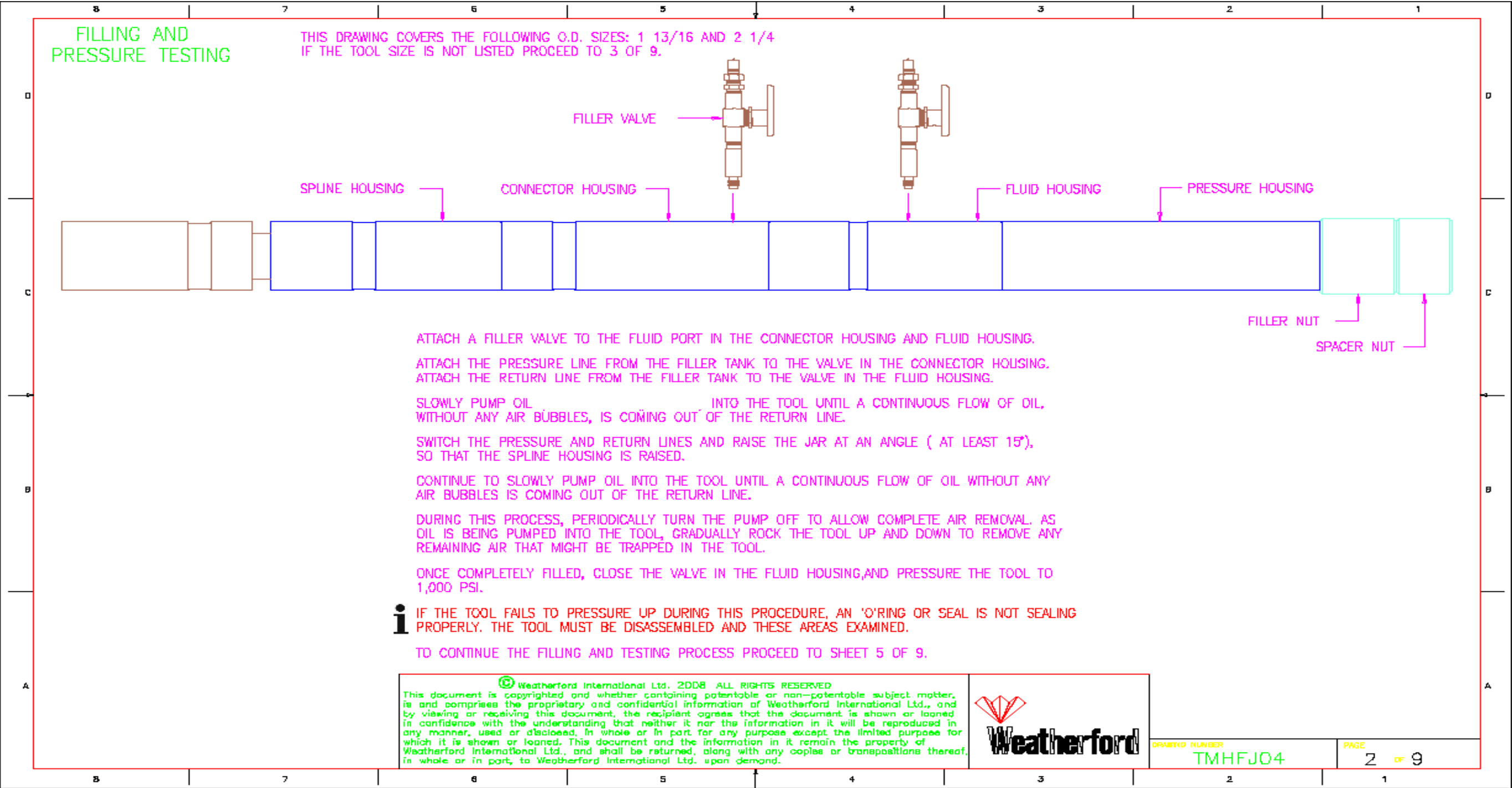
CHAPTER: 8.00 – R&M SERVICE LEVEL III FILLING

 NOTE	NOTE
	• Upon completion of this chapter please move to Chapter 11.00 for Testing and Operation procedures • See Chapter 12.00 for Fluid Plug Assembly Guidance • See Chapter 14.00 for Fluid Filling Specification(s)

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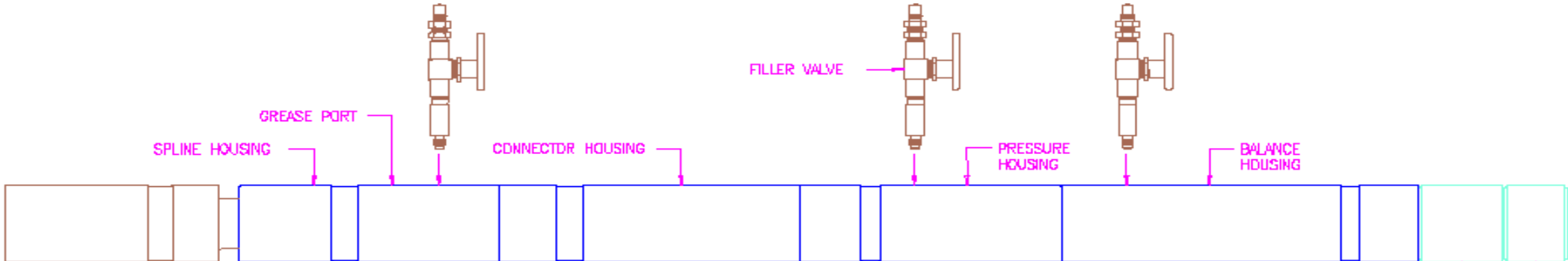
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FILLING AND
PRESSURE TESTING

THIS DRAWING COVERS THE FOLLOWING O.D. SIZES:

3 1/8
3 3/4
4 1/4 x 2 1/8
4 3/4 x 2 1/4

IF THE TOOL SIZE IS NOT LISTED PROCEED TO SHEET 4 OF 9.



ATTACH A FILLER VALVE TO THE FLUID PLUG PORT ON THE SPLINE HOUSING AND PRESSURE HOUSING AND BALANCE HOUSING. (THE 3 1/8 HAS THE FLUID PORT IN THE CONNECTOR HOUSING INSTEAD OF THE SPLINE HOUSING).

ATTACH THE PRESSURE LINE FROM THE FILLER TANK TO THE VALVE IN THE BALANCE HOUSING. ATTACH THE RETURN LINE FROM THE FILLER TANK TO THE VALVE IN THE PRESSURE HOUSING.

SLOWLY PUMP OIL INTO THE TOOL UNTIL A CONTINUOUS FLOW OF OIL, WITHOUT ANY AIR BUBBLES, IS COMING OUT OF THE RETURN LINE.

REMOVE THE RETURN LINE FROM THE VALVE IN THE PRESSURE HOUSING AND ATTACH IT TO THE VALVE IN THE SPLINE HOUSING.

AT THIS TIME IT WILL BE NECESSARY TO RAISE THE JAR AT AN ANGLE (AT LEAST 15°) SO THAT THE SPLINE HOUSING IS ELEVATED. AS OIL IS BEING PUMPED INTO THE TOOL, GRADUALLY ROCK THE JAR UP AND DOWN TO REMOVE ANY REMAINING AIR THAT MIGHT BE TRAPPED IN THE TOOL.

CONTINUE TO SLOWLY PUMP OIL INTO THE TOOL UNTIL A CONTINUOUS FLOW OF OIL, WITHOUT ANY AIR BUBBLES, IS COMING OUT OF THE RETURN LINE. DURING THIS PROCESS, PERIODICALLY TURN THE PUMP OFF TO ALLOW COMPLETE AIR REMOVAL.

ONCE COMPLETELY FILLED, CLOSE ALL VALVES, EXCEPT IN THE BALANCE HOUSING, AND PRESSURE THE TOOL TO 1,000 PSI.

i IF THE TOOL FAILS TO PRESSURE UP DURING THIS PROCEDURE, AN 'O'RING OR SEAL IS NOT SEALING PROPERLY. THE TOOL MUST BE DISASSEMBLED AND THESE AREAS EXAMINED.

TO CONTINUE THE FILLING AND TESTING PROCESS PROCEED TO SHEET 6 OF 9.

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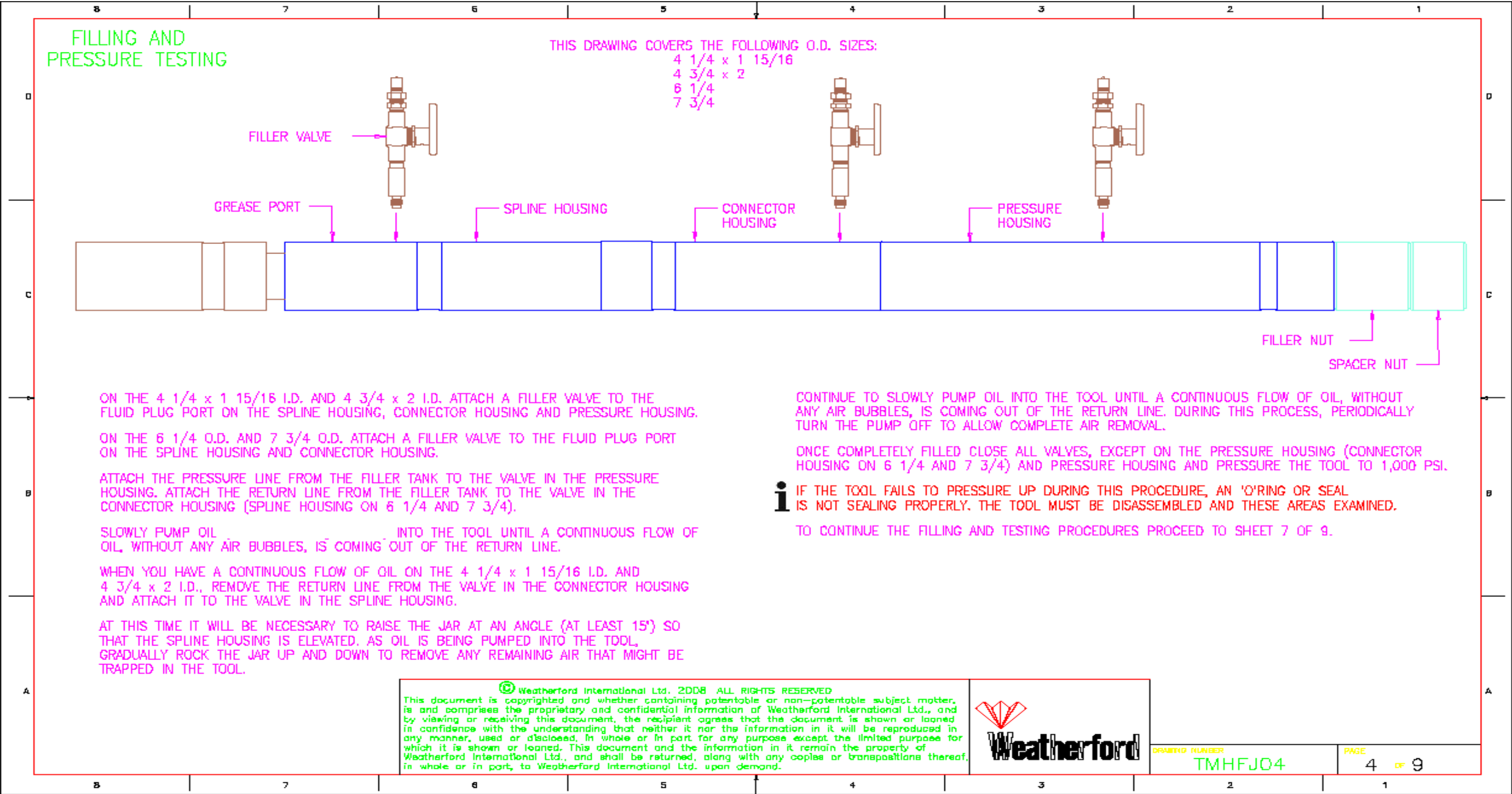
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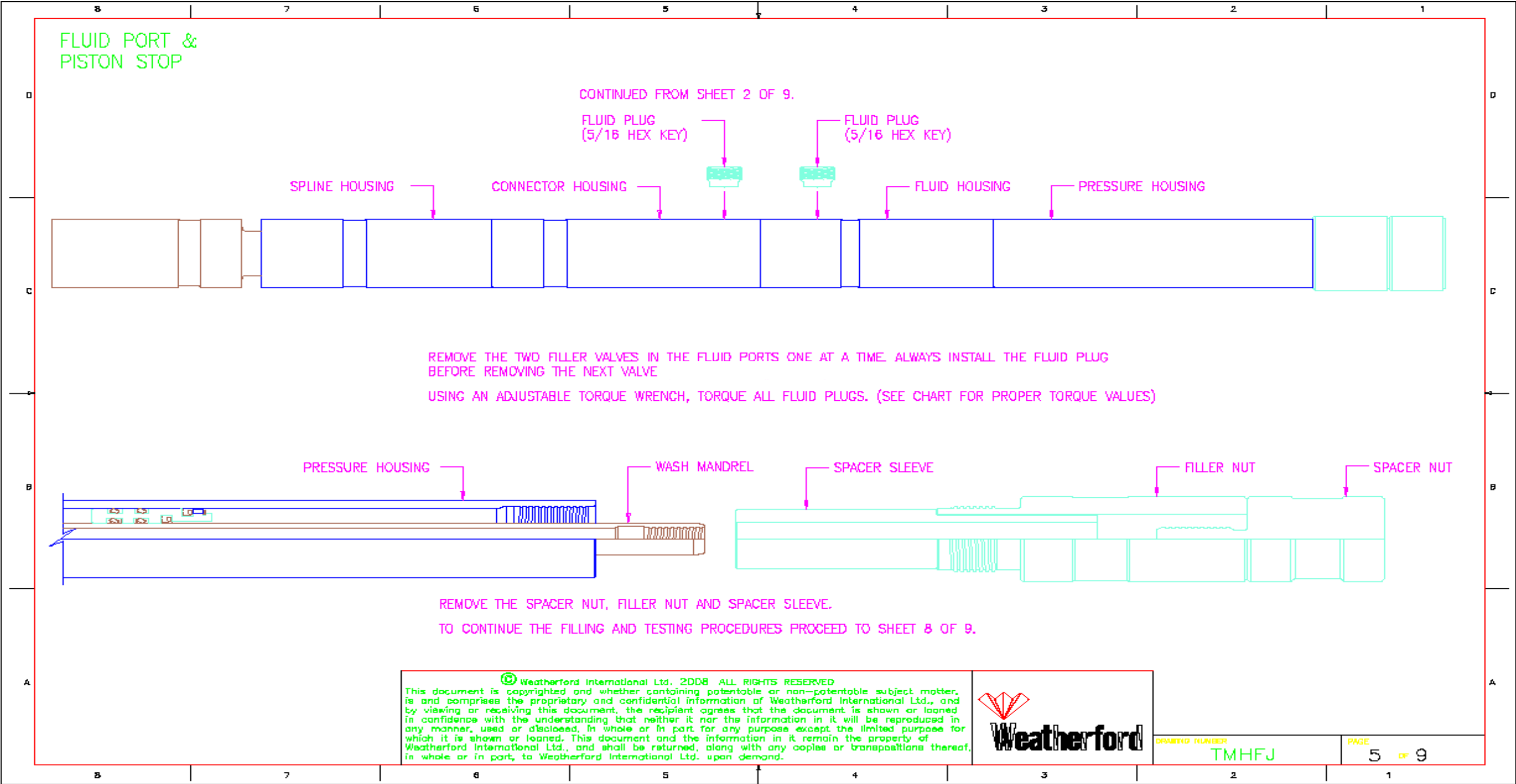
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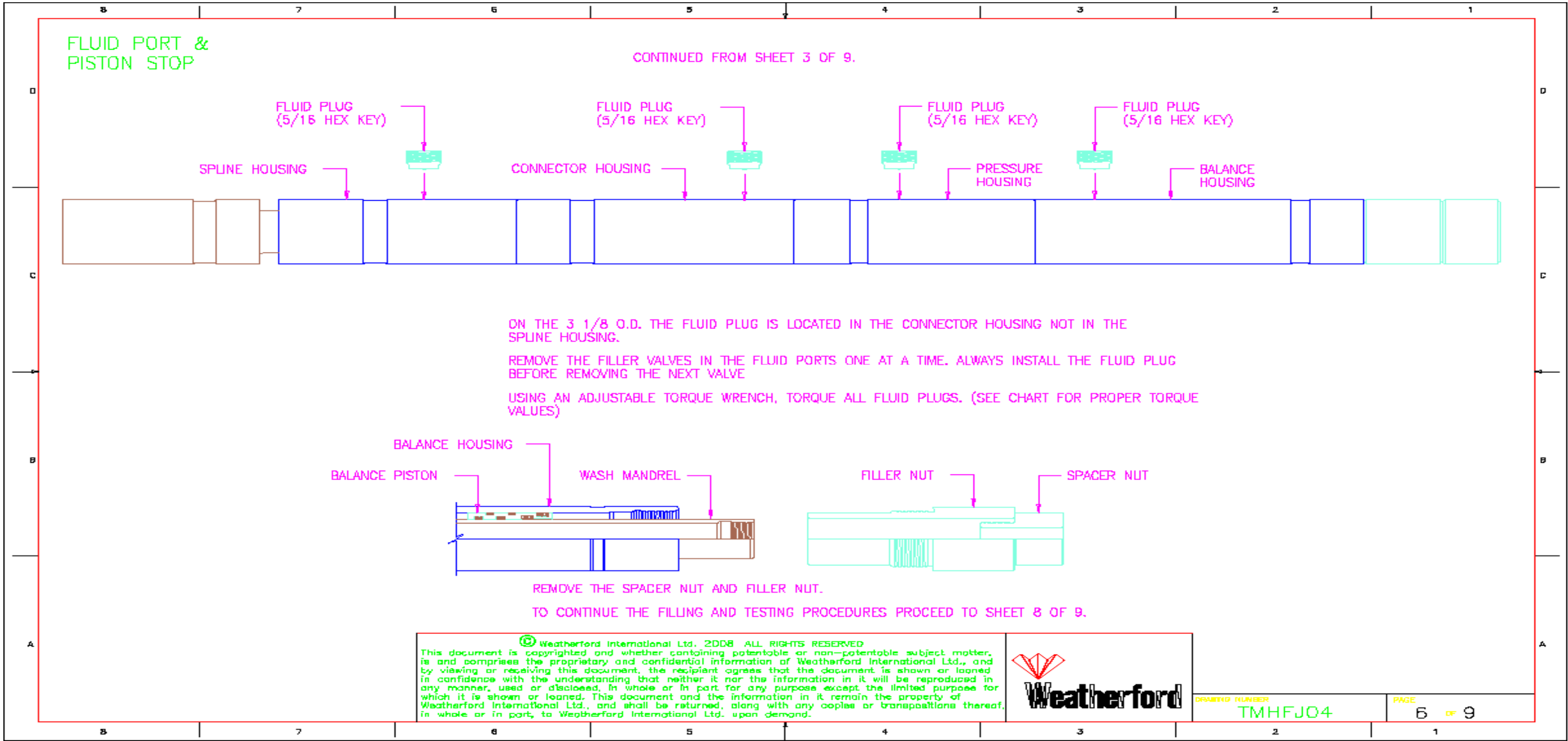
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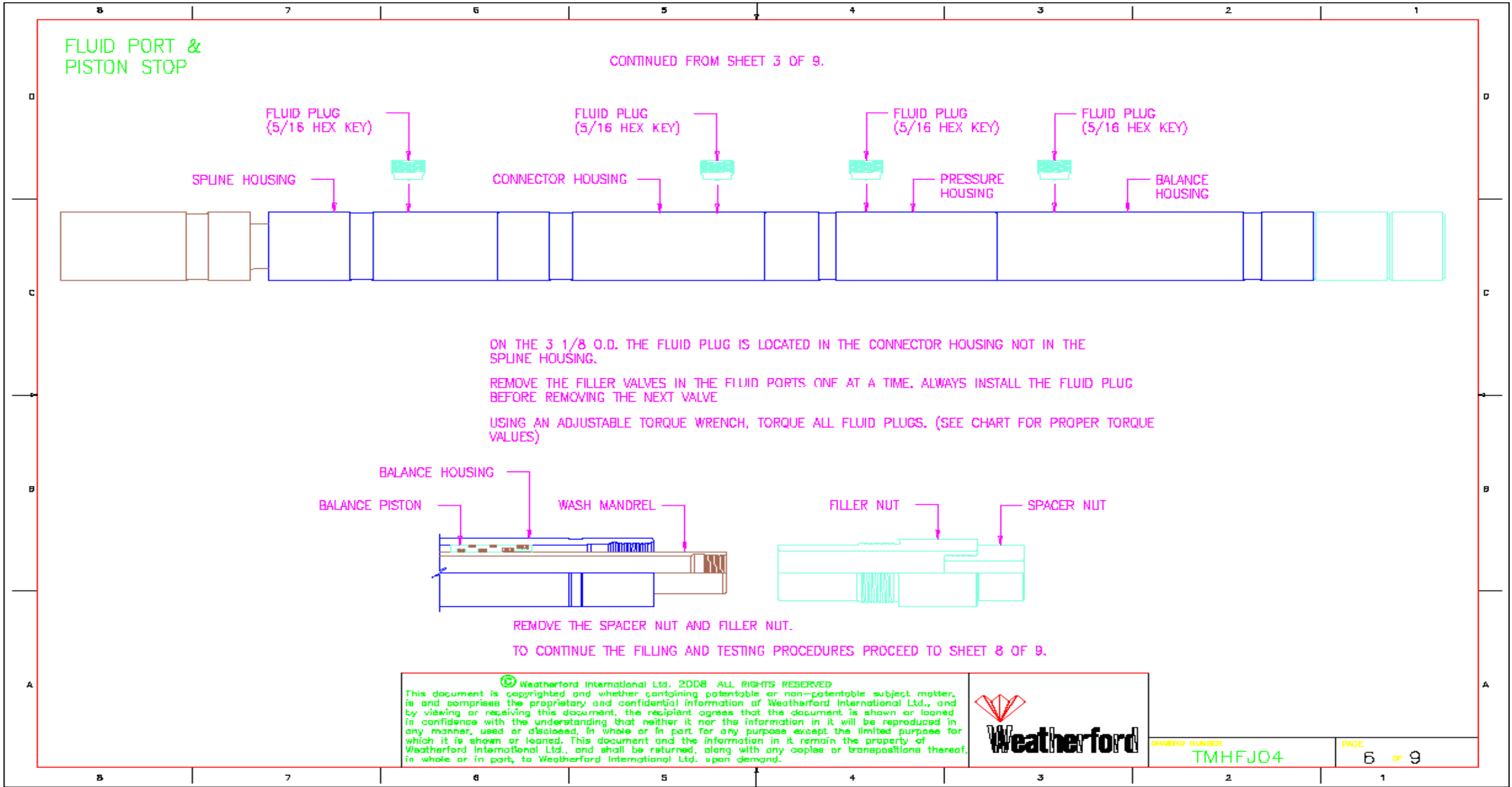
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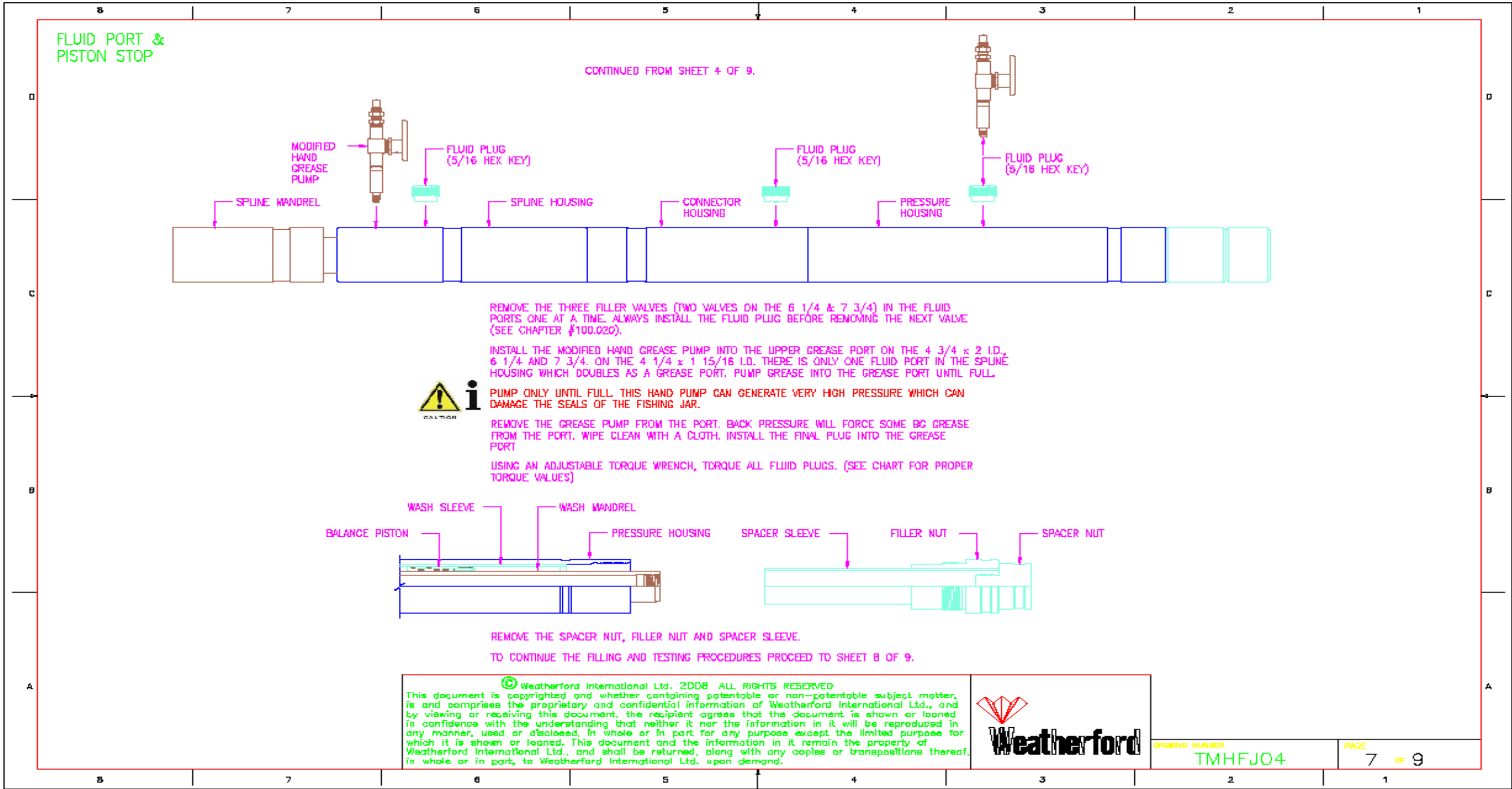
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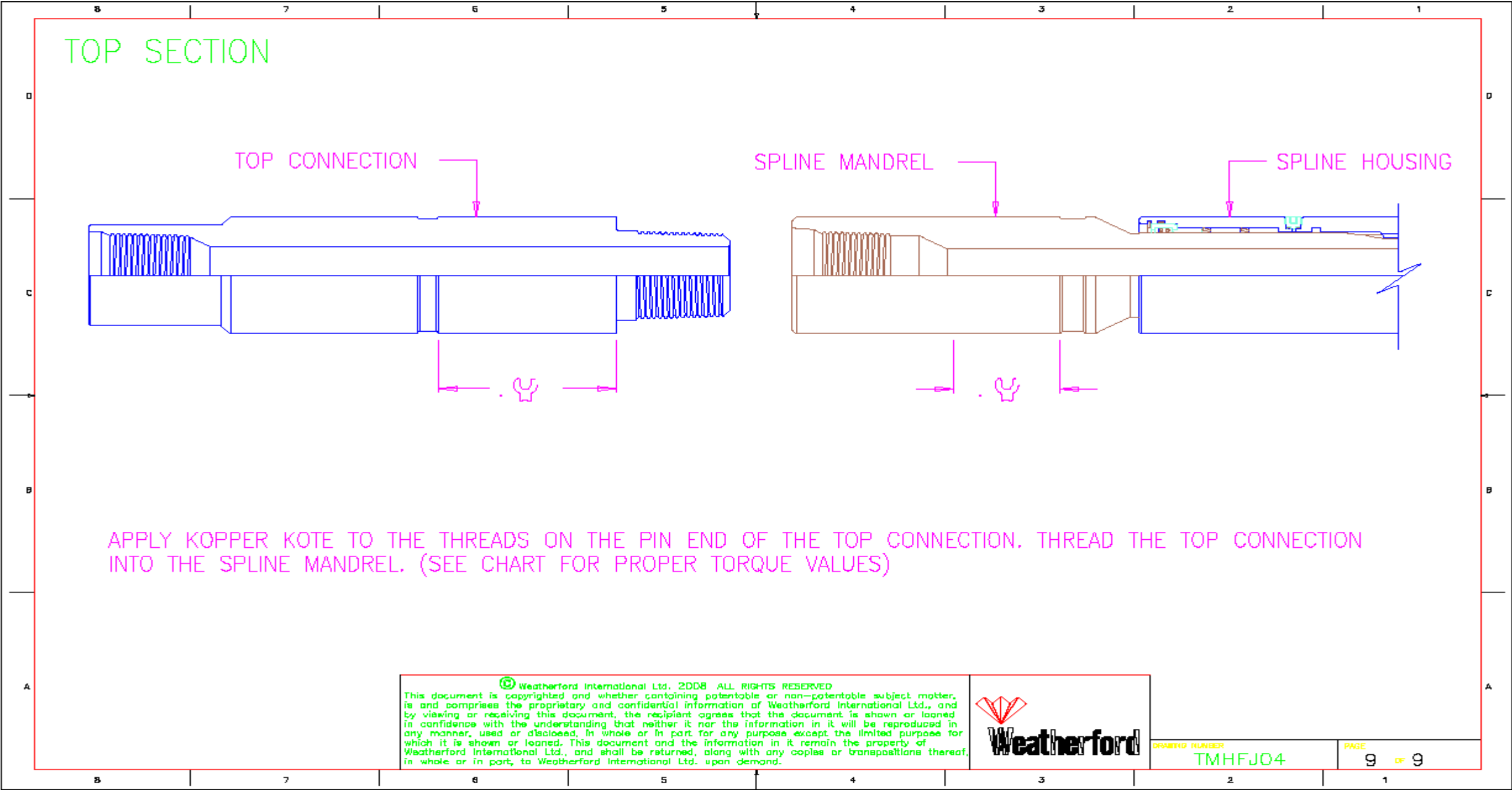
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CHAPTER: 9.00 – R&M SERVICE LEVEL II

 NOTE	NOTE
	• Please ensure that all connections and critical areas are inspected for conformance as detailed in Chapter 12.00 • Only approved facilities can conduct Service Level II of Fishing Impact Tools. Please consult with Global Product Line for further Guidance

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9.010 – Service Level II Scope

The following guidance should be used to conduct R&M Service Level II, for qualifying Dailey Fishing Impact Tools only.

Operational limits (which must not be exceeded) for R&M Service Level II to be conducted on Dailey Fishing Impact Tools are:

1. 150 maximum accumulated Operating (Below Rotary Table) Hours
- and/or
2. 80 hours accumulated Jarring Hours. Jarring Hours are defined as hours tool has been subject to activation such as working of string in fishing operation and/or actual jarring time, but not when the pipe is idle for extended periods during other operations such as circulation, spotting a pill, etc.

Confirmation of Operational and Jarring hours is required from previous job and current returned job.

These hours MUST be recorded in WPTS job entry and MyAdvisor.

In the event that this information is not available then the Fishing Impact Tool is not eligible for Service level II.

This process is only applicable to Weatherford Dailey Tools, for all other non-Weatherford manufactured Impact Tools the OEM guidance should be followed at all times.

9.020 – Service Level II Process Steps

1. All R&M tasks should be conducted using My Advisor.
2. Ensure that the Impact Tool passes all prerequisites as stipulated in this Service Manual (Chapter 4) and recorded on MyAdvisor prior to commencing work.
3. If present remove any items torqued to the main assembly such as crossovers or other tools in a safe manner. Tasks related to Service Level II are applicable to the Impact Tools only and no other items.
4. The Impact Tool should have been thoroughly cleaned upon return and any damages on external surfaces or missing components should be noted in MyAdvisor PFT and Photos uploaded if available.
5. Conduct the Pre-Repair function testing as directed in the manual to determine if tool is currently operating within parameters. If tool fails Pre-Repair (Dirty) Test, then reject and move to Service Level III process, refer to Chapter 5.00
6. Conduct inspection processes on the Impact Tools as per Chapter 11.00 of this manual.
7. Measure and record all component ODs for wear. Refer to Chapter 11.00 and 14.00 for guidance
8. Ensure all inspection equipment used is properly calibrated and in working condition. Refer to Chapter 11.00 for further guidance
9. All exposed rotary connections should be fully assessed and inspected as per relevant inspection standard, OEM specifications and /or Service manual guidance
10. Assess condition of Spline Mandrel surface – Seal areas should be inspected for corrosion/pitting etc. Refer to **GL-DRT-OEPS-L4-06 - Inspection Acceptance Criteria for Corrosion and Pitting**.
11. Pay particular attention to Truarc retaining area. There should be no damage present and the keeper should be in place. In the event there is any indication of damage the tool should be rejected, and Level III service should be implemented.
12. Check all housing connections are made up to correct torque in torque machine, refer to Chapter 14.02 for Housing Torque values
13. Conduct final testing as per guidelines in Chapter 10.00. Should the tool fail testing then Service Level III should be conducted
14. If tool passes all testing requirements proceed to Chapter 14.00 for guidance on painting and storage requirements
15. Ensure all data is recoded in MyAdvisor and relevant inspection and associated reports uploaded into tool file

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CHAPTER: 10.00 – TESTING/OPERATION ALL SERVICE LEVELS

10.010 – Pre-Repair Test Procedure

1. Visually check the Jar for any damage or missing Fluid Plugs. If a plug is missing, the Jar cannot be rack tested.
2. Steam clean the I.D. thoroughly from both ends. Clean both box and pin and the polished surface on the Spline Mandrel.
3. Place the jar in the test rack and follow the Rack Testing Procedure outlined in Chapter #80.020.
4. Record both 1/2” metering and overall time and compare with the latest redress report (History File). If the metering time is outside the published tolerance per metering times chart in Section 80.020, check:
 - a. Make sure tool is completely filled
 - b. Lapped surfaces of the Valve and Valve Seat.
 - c. Lapped surfaces of the Pressure Piston and Piston Seat.
 - d. O-rings on the Valve and Piston
5. If all surfaces and O-rings are in good condition, inspect Viscos for damage.

10.020 – Rack Testing Procedure

Place the Jar in test rack.

 CAUTION	CAUTION	
	• Do not attach the air to the jar before it is placed in the test rack.	•

Set the test rack to the appropriate pressure given in the Pressure Chart. As the Jar is being pulled open, it will initially stop at the D1 position. This position is the cocked position. Record the distance between the face of the Spline Mandrel and the face of the Spline Housing.

Start the stopwatch when the test rack slinger bottoms out. As the test rack pump gage reaches the set pressure, the mandrel will pull out to the D2 position, it will then begin to meter open slowly. Record the D2 distance between the face of the Spline Mandrel and the face of the Spline Housing.

As the tool is slowly metering open, record how long it takes for the mandrel to travel one-half of an inch (1/2”). The mandrel will slowly meter open and then stop. This is the tripping open position. Record the distance between the face of the Spline Mandrel and the face of the Spline Housing.

When the Jar fires open, stop the stopwatch and record the overall tripping time. With the jar fully open, record the distance between the face of the Spline Mandrel and the face of the Spline Housing.

TEST RACK PRESSURE CHART	
OD SIZE (INCES)	PRESSURE (PSI)
1-13/16	300
2-1/4	500
3-1/8	500
3-3/4	500
4-1/4	1000
4-3/4	1000
5	1000
6-1/4	1000
6-1/2	1000
7-3/4	1000
8	1000

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If the metering time is substantially less than or greater than the values in the “Hydraulic Fishing Jar Metering Times” chart, check:

- Make sure tool is filled completely.
- Lapped surfaces of the Valve Set.
- Lapped surfaces of the Pressure piston and the Piston Set.
- O-rings on the Valve and Piston.

If all surfaces and O-rings are in good condition, inspect Viscos for damage.

Actuate the Jar 10 times to ensure a consistent 1/2” metering and tripping time.

Hydraulic Fishing Jar Metering Times

ALL JARS TESTED AT CHARTED PRESSURE						
SIZE (INCHES)	RESRICTOR (NO. @ P/N)	½” METERING (SECONDS)	OVERALL TIME (SECONDS)	D1 (INCHES)	D2 (INCHES)	D2-D1 (INCHES)
1-13/16 X 1 1/2	1@198K	:13 +/- :04	:28 +/- :05	1-1/8	2-5/8	1-1/2 +/- 1/4
2-1/4 x 11/16	1@ 198K	:16 +/- :04	:29 +/- :05	13/16	2-3/4	1-15/16 +/- 1/4
3-1/8 x 1-1/4	2@ 198K	:13 +/- :04	:28 +/- :05	1-1/4	2-1/8	7/8 +/- 1/4
3-1/8 x 1-1/2	2@ 198K	:16 +/- :04	:32 +/- :05	1-1/8	1-7/8	3/4 +/- 1/4
3-3/4 x 1-1/2	2 @ 198K	:33 +/- :06	1:17 +/- :10	1-1/4	1-7/8	5/8 +/- 1/4
3-3/4 + 1-15/16	2@ 198K	:18 +/- :04	:34 +/- :07	1-1/4	2-1/4	1 +/- 1/4
4-1/4 X 2-1/8	2@ 198K	:22 +/- :04	:30 +/- :07	1	1-3/4	3/4 +/- 1/4
4-3/4 X 2	2@ 198K	:21 +/- :04	:54 +/- :10	1	2	1 +/- 1/4
4-3/4 X 2-1/4	2@ 800H	:16 +/- :04	:37 +/- :07	1-1/8	1-5/8	1/2 +/- 1/4
5 X 2 1/4	2@800H	:16 +/- :04	:37 +/- :07	1 3/4	2 1/2	3/4 +/- 1/4
6-1/4 X 2-1/4	2@ 41K	:22 +/- :04	1:07 +/- :14	1-1/2	2-1/8	5/8 +/- 1/4
6-1/2 X 2-3/4	2@ 41K	:21 +/- :04	1:05 +/- :16	1-1/2	1-7/8	3/8 +/- 1/4
7-3/4 X 3	2@ 41K	:33 +/- :07	2:05 +/- :18	1-1/4	1-7/8	5/8 +/- 1/4
8 X 3	2@ 41K	:33 +/- :07	2:05 +/- :18	1-1/4	1-7/8	5/8 +/- 1/4

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CHAPTER: 11.00 – INSPECTION

11.010 - Pre-Cleaning of Parts and Visual Inspection

When a tool is received from a rig or location and signs of rust are evident, the entire tool should be completely wire-brushed to remove as much rust as possible.

 NOTE	NOTE
	Do not use soft, or hard wheel on any mid-body connections.

Excessive rust or build-up on the O.D. of the tool can mask cracks or flaws which otherwise should be detected during the inspection procedure.

The I.D. and O.D. of all parts should be thoroughly steam-cleaned for removal of any foreign material which could mask an indication of cracks or flaws.

All parts should be checked visually for washouts, galled threads, tool face damage and any other damage which could possibly cause a subsequent tool failure.

11.020 – O.D. Wear Checks

The following parts should be calibrated for O.D. wear, using the values provided in Chapter 14.07:

Component	Service Level II	Service Level III
Upper Connector	X	X
Spline Mandrel	X	X
Spline Housing	X	X
Connector Housing	X	X
Pressure Housing	X	X
Balance Housing	X	X
Pin x Pin Connector	X	X
Bottom Connector	X	X

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11.030 – Magnetic Particle Inspection of Parts

Once parts have been cleaned, they must be inspected in accordance with the [Wet Fluorescent Magnetic Particle Inspection for Used Jars](#). After inspection, all parts must be demagnetized, and steam cleaned again prior to assembly to prevent the introduction of magnetic particle into the fluid and hydraulic working parts.

The following parts require Magnetic Particle Examination:

Component	Service Level III	Service Level II
Upper Connection	X	X
Spline Mandrel	X	End Connection
Spline Housing	X	
Flow Mandrel	X	
Wash Mandrel *	X	
Connector Housing	X	
Pin x Pin Connector	X	
Pressure Housing	X	
Balance Housing	X	
Hammer	X	
Bottom Connection	X	X

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11.040 – Special Cleaning Requirements

All internal parts must be cleaned with approved cleaning solutions. Blow dry (air) internal parts, and store in a clean area. Always use the lint free towels (P/N C025000) to place parts on.

 NOTE	NOTE
	Never use the lint free towels to wipe parts.

The following parts require this method of cleaning:

Component	Service Level III=	Service Level II
Valve	X	N/a
Upper Pressure Piston	X	N/a
Bronze Rings	X	N/a
Pressure Piston Cap	X	N/a
Spring	X	N/a
Screws	X	N/a
Spacers	X	N/a
Steel Ring	X	N/a
Lower Pressure Piston	X	N/a
Balance Piston	X	N/a
Piston Stop Nut	X	N/a

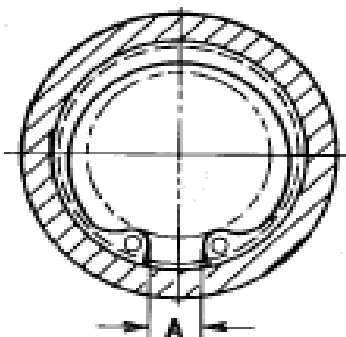
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11.050 - Inspection Procedures and Dimensions for Truarc Grooves

FIG. 4:
MINIMUM GAP WIDTH
 (Ring installed in groove)



Tool Prefix	Tool OD	Truarc Ring Size	Minimum Gap w/ Ring Installed (A)
1504	4-3/4"	1412V425	0.96"
1506	6-1/4"	1412V525	1.10"
1501	6-1/2"	1412V575	1.11"
1507	7-3/4"	1412V700	1.26"
1502	8"	1412V700	1.26"

 NOTE	NOTE
	- After installing the truarc, measure the minimum gap dimension. ref: (A) Thus will insure correct seating of the truarc ring in the groove. - There should be a slight interference fit between the keeper and retainer ring – it should not be loose and free to move in the groove.

It is recommended to measure the groove in multiple intervals (minimum 4) equally spaced around the inner circumference of the spline housings and record maximum width measured at the top of the groove.

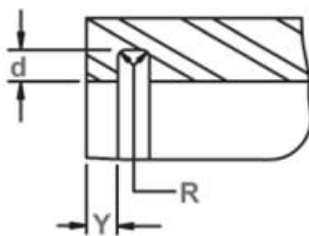
It is also recommended to measure width at bottom of the groove at these same points. This will indicate if there is significant angularity in the groove.

The walls of the Tru arc groove (d callout and opposite) should be perpendicular (@ 90°) to the bottom of the groove (between the arrows on R callout). If unsure of any variance found during inspection, please contact product line/engineering team for guidance.

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Significant angularity causes the top of the truarc groove to be wider than the bottom of the groove and may cause the truarc ring to become dislodged from the spline housing. When this happens, the internal parts of the spline housing will be ejected.

A maximum difference of 0.010" between the top and bottom of the groove at the measured points is acceptable. Difference over this value should be highlighted to engineering team for further disposition.

Maximum Inspection Width for Truarc Grooves		
Tool Prefix	Tool OD	Maximum Dimension at Top of Truarc Groove
1504	4-3/4"	0.143"
1506	6-1/4"	0.160"
1501	6-1/2"	0.160"
1507	7-3/4"	0.200"
1502	8"	0.200"

 NOTE	NOTE
	- At every repair, check the Truarc ring groove in used spline housings of all tools for angularity at the top of the groove. - This angularity causes the top of the truarc groove to be wider than the bottom of the groove and can cause the truarc ring to become dislodged from the spline housing. When this happens, the internal parts of the spline housing will be ejected.

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11.050 – Minimum Pressure Spring Lengths

It is very important to check the lengths of all pressure springs during the repair process of jars. A pressure spring below the minimum spring length could affect the jar functionality. If a pressure spring is below the minimum tolerance, immediately scrap the spring. Do not attempt to stretch a pressure spring. Please refer to specific Bill of Materials for Impact Tool being worked on to determine which Pressure Spring Part No. is installed.

Part Number	Description	Jar Size	Minimum Length In. / Mm
1503231B	Spring, pressure piston, jar HYD fishing 4-1/4 OD 2-1/8	4 1/4" x 2-1/8"	15-3/4" / 400.05
1504231A	Spring,Piston,Pressure,3.77x3.02x12.00,Jar FSHG HYD 1504	4 3/4" x 2 1/4"	11-1/2" / 292.1
1505231A	Spring,Piston,Pressure,2.38x1.88x12.00,Jar FSHG HYD 1505	3 1/8" x 1 1/4"	11-3/8" / 288.92
1509231A	Spring,Piston,Pressure,1.16x0.91x10.50,Jar FSHG HYD 1509	1 13/16" x 1/2"	10" / 254
1510231A	Spring,Piston,Pressure,1.51x1.13x11.75,Jar FSHG HYD 1510	2 1/4" x 1 1/16"	11-1/8" / 282.58
337231012	Spring,Piston,Pressure,3.03x2.57x14.00,Jar FSHG HYD 3372	3 3/4" x 1 15/16"	13-3/8" / 339.73
1400231A	Spring, Piston, Pressure,3.76x3.01x20.38, Jar DLG HYD 1400	4 3/4" x 2 1/4"	19-5/8" / 498.48
1416231A	Spring, Piston, Pressure,4.64x3.76x20.50, Jar DLG HYD 1416	6 1/2" x 2 3/4" 7" x 2 3/4"	19-3/4" / 501.65
1417231A	Spring, Piston, Pressure,5.39x4.39x20.75, Jar DLG HYD 1417	8" x 3"	20" / 508
1549231B	Spring, Piston, Pressure,5.62x4.50x23.25, Jar DLG HYD 1549	9 1/2" x 3"	22-3/4" / 577.85

CHAPTER: 12.00 – SPECIAL INSTRUCTIONS

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12.010 - Lapping Procedure

The purpose of lapping each surface is to ensure that each surface is flat, allowing for an effective seal. If the two (2) lapped surfaces do not seal properly, the tool will not function.

After the Pressure Piston and Valve has been disassembled, it should be cleaned in solvent and blown dry.

Visually check each lapped surface for any damage. If surfaces are damaged, refer to procedure Step 3. If all surfaces appear to be in good condition, then apply 280-grit to all lapped surfaces and Lab. After the 280-grit compound has been used once, the surfaces should then be blued and relabeled using 500-grit compound until all bluing is gone, if bluing is not removed, repeat process.

 NOTE	NOTE
	Do not lap mating surfaces without lapping compound due to the possibility of galling the parts.

1. If the surfaces have been damaged either by drilling mud or steel particles, it will be necessary to begin lapping with 100-grit compound. While using this grit of compound, it is not necessary to blue the lapped surfaces. Once the dings or nicks are lapped out, 280-grit lapping compound can be used to smooth up the surfaces. After 280-grit compound has been used once, the surfaces should be blued and re-lapped using the 280-grit compound on all tools 4-3/4" and above or use 500-grit compound on all tools less than 4-3/4" until all bluing is gone. Under no circumstances shall any surface be lapped with only 100-grit compound.
2. All new parts must be lapped with its mating surface before assembly to ensure a positive seal.
3. Once all surfaces are lapped and all the bluing has been removed, the parts should be thoroughly cleaned to remove any excess compound. The parts should then be stored in a clean environment prior to assembly.

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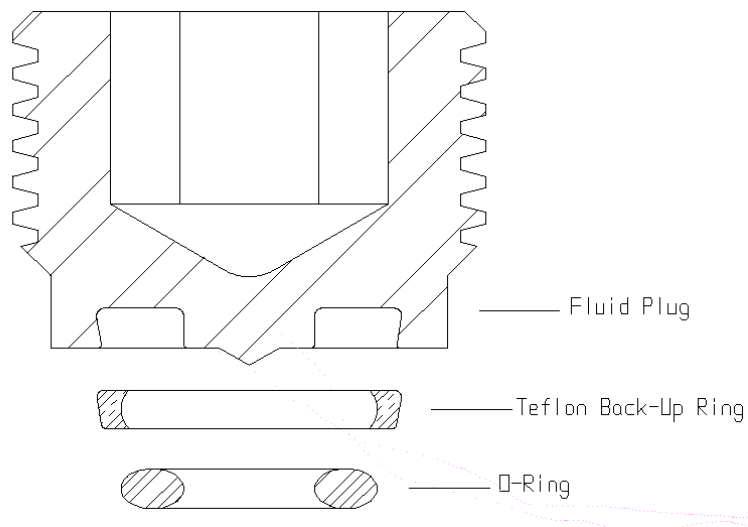
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12.020 – Fluid Plug Assembly

- Each fluid plug consists of the plug itself, a Teflon back-up ring, and an O-ring.
- Insert the Teflon back-up ring into the fluid plug so that the larger tapered edge goes in first.
- Insert the O-ring, ensuring that it is properly seated in both the back-up ring and plug.
- Install the fluid plugs in the housings and torque accordingly (refer to chart for proper torque).

 NOTE	NOTE	
	• Be sure that the O-Ring has been installed properly to eliminate the possibility of oil leakage.	

 NOTE	NOTE	
	• Note: Use Loctite on each fluid plug before installing them into the fluid plug hole	



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12.030 – Installation / Extraction of Lee Inserts and Pins

Installation Procedure:

 NOTE	NOTE	
	See assembly/disassembly drawing for information and orientation. See chart for pin and insert body thread sizes.	

1. Thoroughly soak Pressure Piston in cleaning solvent to free any unwanted debris. Blow dry with air.
2. Using the proper size Reamer, ream the holes.
3. Repeat step 1.
4. Thread the Insert Body onto the Body Tool.
5. Push, **DO NOT HAMMER**, the Insert Body until it is seated against the 45° shoulder. Remove the Body Tool.
6. Thread the Pin completely onto the Installation Tool.

 NOTE	NOTE	
	It may be necessary to chase or replace the threaded set screw of the installation tool at this time.	

7. Drive the pin into the body until the pin is flush with the body.
8. Remove Installation Tool.

Extraction Procedure:

Lee Pin (0.187 Visco or Jeva Jets) Removal - Rivet Tool Method

1. Tap the threads of the pin to be removed. Chase the threads of the Extractor Stud.
2. Thread the stud into the pin.
3. Slide the sleeve down over the stud until it is seated against the end of the body.
4. Engage the pin end of the stud with the rivet tool and squeeze the handle until the pin is free.
5. Remove the pin.

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Lee Pin (0.128 PRV) Removal – T-Handle Method

 NOTE	NOTE
	The only time the pressure relief valves should be removed is when the hydraulic fluid has been contaminated or the pressure piston has been scrapped out.

1. Tap the thread of the Pin to be removed. Chase or remove the threaded setscrew of the Extraction Stud.
2. Holding the T-handle, turn the drive nut clockwise until the threads are fully exposed from the Extractor Guide Sleeve. Thread the stud into the Pin.
3. Holding the T-handle, turn the drive nut counterclockwise until the face of the Extractor Guide Sleeve rests against the Insert Body.
4. Grasping the T-handle, use an open-end wrench to turn the drive nut counterclockwise until the Pin is free.
5. Turn the drive nut clockwise until the Pin is exposed from the Extractor Guide Sleeve. Remove the Pin.

Extraction Procedure Cont.:

Lee Insert Body Removal – (0.187 and 0.281 diameter insert bodies)

1. Tap the threads of the Insert Body to be removed. Chase the threads of the Body Tool.
2. Slide the striker onto the Body Tool and thread the Body Tool completely into the pin.
3. Strike the head of the Body Tool with the Striker until the Pin is removed.

 NOTE	NOTE
	It may be necessary to tighten the body tool to the insert body after several hits.

THREAD SIZE		
BODY DIAMETER	PIN Inst. /Extr. Tools Thread Size	BODY Inst. /Extr. Tools Thread Size
0.187 (Visco or Jeva Jet)	4-40 UNC	8-36 UNF
0.281 (Pressure Relief Valve)	6-40 UNF	1 / 4-48 Special

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12.040 – Visco Testing / Back Flushing

There are two separate Test Assembly units, one for the Visco jets and the other for the Jeva Jets.

- The Test Assembly Number for the Visco Jet is **T123000**.
- The Test Assembly Number for the Jeva Jet is **T122000**.

 NOTE	NOTE
	• The individual service centers will have to order the above test assemblies.

The testing procedure is almost the same for each unit:

The Adapter (B) at the end of the Test Unit must be unscrewed to place the Jet in the Adapter (A). You place the Visco Jet in the Adapter (A) with the nose of the Jet pointing in the direction of the Arrow that is stamped on the Adapter (B). Make sure that the Female portion of the Adapter (B) has the O-Ring (D) located in the bottom. The Arrow on the Adapter (B) must be pointing away from the fitting (3) that go into the filling unit. Place the Fitting (3) in the Filler unit and pressurize to 1000 PSI. Collect the flow from the Visco in an ml, container and compare the rate to the proper Visco on page 3.

When testing the Jeva Jet, you screw the small plug unit (marked Jeva only) into the Jeva Jet and place the Jet into the Adapter the same way as the Visco Jet.

When you want to back flush either the Visco or Jeva jets the placement of the Jets in the Adapter (A) and (B) is the same. The Adapter Assembly must be turned around, so that the Arrow on the Adapter (B) is pointed toward the Fitting (3) that go into the filling unit. Place Fitting (3) in the filling unit and pressure to 1000 PSI. The Jet will start to flow, let it flow for about 30 seconds; this will clean the jet for use in the Tool. If the Jet does not flow, then the Jet is completely plugged. Remove it from the Adapter Assembly and throw away the Jet.

Page 2, Shows the assembly of both the Test units and Adapter.

Page 3 has the information on the Flow Rates for each part. The Flow rates are calculated for the amount of time that it takes for the Jet to flow 10 ml of oil. This time can vary 10% either plus or minus. This 10% variation reflects the tolerance on the Jets.

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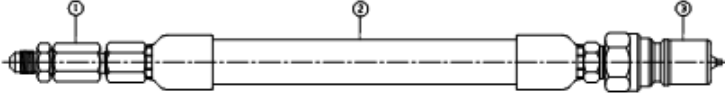
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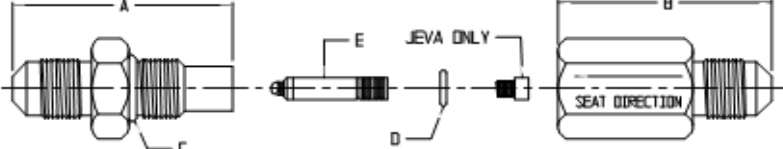
Visco Testing / Back Flushing

Test Fixture

LINE NO.	PART NUMBER	DESCRIPTION	QTY
1	1631V001	JETA TEST FIXTURE	1
2	1631V002	NOSE AND FITTING ASSEMBLY	1
3	1631V003	FEMALE THREAD NIPPLE	1



COMPANY DESCRIPTION	QUANTITY	UNIT	PRICE	TOTAL
1631V001 JETA TEST FIXTURE	1	EA	1122000	1122000
1631V002 NOSE AND FITTING ASSEMBLY	1	EA	1402000	1402000
1631V003 FEMALE THREAD NIPPLE	1	EA	1402000	1402000



ENGINEERING APPROVED VENDOR:
 THE LEE COMPANY
 2 PETTIPAUD ROAD
 P.O. BOX 424
 WESTBROOK, CT 06498-0424
 PHONE: (203)399-6281
 FAX: (203)399-7058

ALL DIMENSIONS ARE IN INCHES

PART NUMBER	VENDOR NUMBER	A	B	C D-RING VENDOR NUMBER	D D-RING VENDOR NUMBER	E	REV
1631V001	CLTX05040508	1.50	1.45	MS28778-4 1402V012	MS28775-008 1402V008	JETA JET	1
1631V002	CLTX03000108	1.45	1.45	MS28778-4 1402V012	MS28775-008 1402V008	VISCO JET	1

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Visco Testing / Back Flushing
Flow Rate

Part Number	Lohm Rate	Time in Seconds to flow 100 ML	Time in Seconds to flow 50 ML	Time in Seconds to flow 10 ML	Max 10 ML	Min 10 ML
162241011	41000	103	51	10	11	9.5
162241012	198000	496	248	50	55	47.5
1464V125H	12500	32	16	3	3.3	2.85
1464V160H	16000	40	20	4	4.4	3.8
1464V248H	24800	62	31	6	6.6	5.7
1464V800H	80000	200	100	20	22	19
1464V313H	313000	784	392	78	85.8	74.1

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Acceptable Alternative Vendor Part Numbers

PIN

④ (REF P/N 1618V001)

INSERT

TO BUILD A PART NUMBER: ADD TO THE DRAWING NUMBER '1464V' A FOUR DIGIT NUMBER CONSISTING OF THE LAST FOUR DIGITS FROM THE VENDORS PART NUMBER
EXAMPLE : 1464V800H

PART NUMBER	LOHM RATE	TOL	MINIMUM PASSAGE	VENDOR NUMBER	ACCEPTABLE ALTERNATE VENDOR NUMBERS	REV
1464V125H	12500	10%	.019	JEVA1840125H	JEVA1845119H JEVA1845125H JEVA1845132H	3
1464V160H	16000	10%	.019	JEVA1840160H	JEVA1845152H JEVA1845160H JEVA1845168H	
1464V248H	24800	10%	.013	JEVA1830248H	JEVA1835236H JEVA1835248H JEVA1835260H	
1464V800H	80000	10%	.009	JEVA1820800H	JEVA1825762H JEVA1825800H JEVA1825840H	
1464V313K	313000	10%	.006	JEVA1810313K	JEVA1815299K JEVA1815313K	5

ENGINEERING APPROVED VENDOR

④ THE LEE COMPANY
122 WEST CARPENTER FREEWAY
SUITE 465
IRVING, TX 75039
(214) 771 - 1100

① REVISED AND UPDATED COLUMNS

COMPUTER DESCRIPTION EXAMPLE	JET, J E V A, 1 8 2 5 8 0 0 H																LOG #
	5	09/19/97	97100902														
	4	11/03/94	10745														
	3	06/19/92	8953														
	2	04/28/92	8758														
	REV #	DATE	ECN #														
CHECKED BY: 7423	APP'D BY: TOM BEASLEY	DWG. NO. 1464V															
				LEE JETA JET CHART SHT. 1 OF 1													

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CHAPTER: 13.00 - TROUBLESHOOTING

13.010 – Wash Mandrel and Flow Mandrel Removal

Should the Flow Mandrel connection break at the Spline Mandrel, when attempting to break the Wash Mandrel and Flow Mandrel, relocate the assembly with the Connector Housing in the floor vise. Place the breakout tongs beyond, but near the fluid plug hole. Break connection and unscrew the pressure Housing.

Position support stand(s) under the Pressure Housing to maintain a level position. While removing the Pressure Housing, take caution that this assembly does not fall to the floor. Set this assembly aside for later disassembly. Remove the Connector housing, Hammer, Spline Mandrel, and internal parts of the Spline Housing.

Position the Pressure Housing in the center of the collar vise. Thread the Spline Mandrel into the box connection of the Flow Mandrel. Support the Spline Mandrel with a support stand. Place a 48" pipe wrench under the box connection of the Flow Mandrel to hold back-up. Position another support stand under the large diameter of the Wash Mandrel so as to keep the Wash Mandrel level. Use the hex wrench with a cheater pipe to break the connection between the Wash Mandrel and the Flow Mandrel. Unscrew and remove the Wash Mandrel.

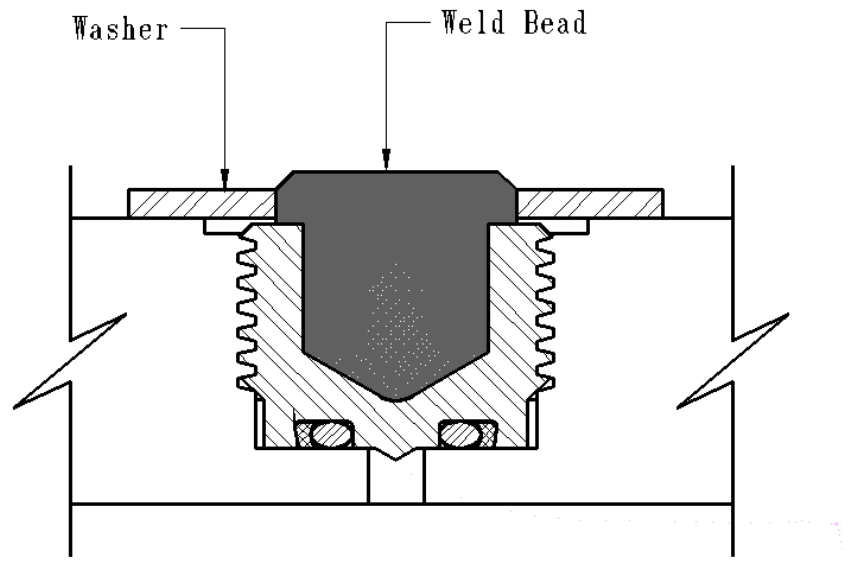
Remove the Spline Mandrel from the Flow Mandrel and slowly pull the Flow Mandrel out of the Pressure Sleeve.

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13.020 – Fluid Plug Removal



Most Fluid Plugs are easily removed by using an appropriate hex key wrench and break-over bar. If the hex socket has been deformed, the plug can be removed by welding a flat washer to the Fluid Plug. The Fluid Plug can then be removed with the use of a pipe wrench to grasp the washer.

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13.030 – Fluid Plug Removal with Heat

If any of the Fluid Plugs cannot be removed with use of a break over bar combined with a cheater pipe, heat might need to be applied to the Fluid Plug for removal. Another possibility is that torque lock adhesive was applied to the Fluid Plug during assembly, also requiring the application of heat for removal.

The area around the Fluid Plug should be heated evenly, not to exceed 650° F (343 C). This is to be controlled and verified with the use of appropriately rated heat sticks.

Fluid Plug removal should be attempted intermittently while bringing the area up to temperature. Once the Fluid Plug is removed, allow the housing to cool slowly.

 NOTE	NOTE	
	Do not exceed 650° f (343 c) or you will damage the housing.	

13.040 – Oversized Fluid Plug

During the removal of the Fluid Plugs, a Fluid Plug Port may be damaged beyond conventional thread repair. If this is the case, the 5/8-18UNF (P/N 1431000A) Fluid Plug Kit will need to be replaced with a 3 / 4-16UNF (P/N 1458000A) Fluid Plug Kit. The Fluid Plug Port will also need to be reworked, using the Rework Drawing in Chapter #130.040, to incorporate this change.

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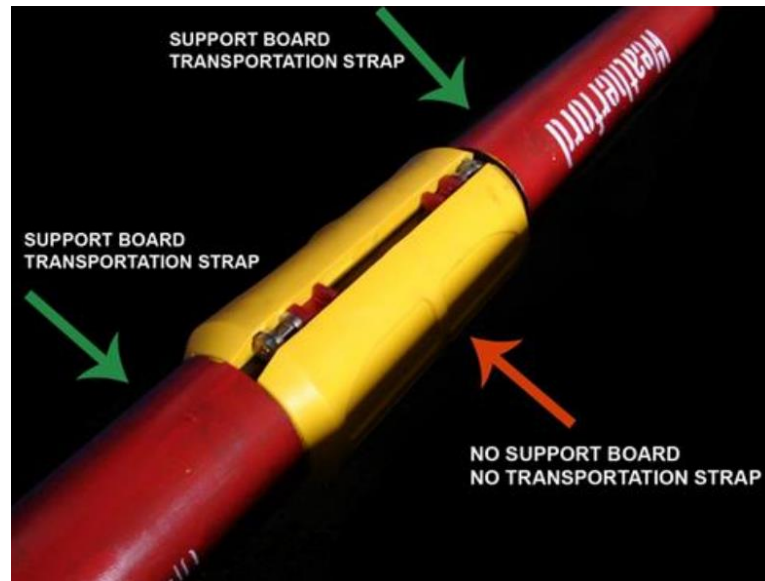
	80 of 100	Performance Drilling Tool Hydraulic Fishing Jar Service Manual					
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CHAPTER: 14.00 – GENERAL TOOL INFORMATION

14.010 – Storage and Shipping Preparation

SHIPPING:

- Never place a support board under the mandrel clamp.
- Never place tie-down chains/transportation straps over mandrel clamp unless the jar is supported.
- All chains/transportation straps must be within 2-3" of support board.
- All exposed threads must have a thread protector in place.



PRE - STORAGE:

- Remove the test rack nipples.
- Obtain the recommended drift by product size(s) and drift the I.D. of the Jar prior to storage.
- Grind all teeth marks left by the tongs or vise.
- Clean with appropriate solution, include the box and pin connections.
- After cleaning, all housings need to be individually measured and recorded on a tally sheet. Overall length of the tool also needs to be recorded.
- Measure O.D. of all the housings and compare to the minimum O.D. allowed for that particular tool. Record these O.D. measurements on the tally sheet.
- Re-stamp serial numbers, heat codes, and other data as required. Record heat codes on the repair work order.

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PAINT & STORAGE

Paint tool with appropriate paint scheme (Weatherford Red). Refer to [GL-WCN-OEPS-L4-55 - Drilling and Fishing Tools Colour Scheme Brand Integrity Guide](#)

- Stencil paint all information (white stencil paint), (type of tool, size of tool, serial number, connections)
- Store all tools according to type and size on stacking boards or support racks.
- Tools that have a Service Level II carried out should have a 1 to 2" black band painted near the balance housing to end connector connection to identify as such. This is to ensure that Level II and Level III tools may be easily identified in storage when selected and confirm service level status.
- This band should be removed when tool has Level III Service conducted

All exposed threads must have a thread protector in place. Store the completed equipment in such a way that protects it from harmful environmental elements and debris.

LONG TERM STORAGE

It is recommended to rotate Jars on the rack if they have sat for more than six (6) months in same position to ensure O-rings and seals are not deformed.

Tools that have sat for longer than six (6) months should be function tested as per test guidelines before being shipped to customer or transferred to another location.

Drifting of equipment should always be conducted to ensure no debris or scale within the ID of the Tool after long term storage and prior to shipping.

There may be an extended time between the servicing of a tool and the time that it is shipped to a customer or transferred to a different location.

If a tool has not been repaired (full disassembly and rebuild) within a three (3) year period, the Service Center that has the tool MUST tear it down for a complete overhaul before it is sent to a customer or transferred to another location. This policy applies even if the tool operates correctly.

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14.020 – Torque Chart

All torque should be applied at right angles (if using buck-up tongs and crane) to the parts being torqued. For fluid plugs and set screws, use an adjustable torque wrench.

Housing Torques values have a tolerance of +10%/-0%. Whilst applying torque to each connection, if the dump valve releases before reaching housing torque, the process must be performed again. Torque must be applied to the housing until the value is met or exceeded by no more than 10%.

O.D. SIZE	ALL HOUSINGS ft-lb	SPLINE MANDREL TO FLOW MANDREL ft-lb	FLOW MANDREL To WASH MANDREL ft-lb	HAMMER SET SCREWS ft-lb	SOCKET HEAD CAP SCREWS ft-lb	FLUID PLUGS ft-lb
1-13/16	750	150	100	20	5	60
2-1/4	1,500	600	200	25	5	60
3-1/8	3,000	700	500	50	6	60
3-3/4 x 1-1/2	5,200	1,100	800	50	6	60
3-3/4 x 1-15/16	3,000	700	500	50	6	65
4-1/4	6,000	1,100	700	50	12	65
4-3/4	14,000	1,400	1,100	60	18	75
5	6,000	2,000	1,000	n/a	18	40
6-1/4	18,000	2,800	2,100	90	18	80
6-1/2	18,000	2,800	2,100	90	18	80
7-3/4	32,000	4,200	2,800	90	18	80
8	32,000	6,000	4,000	125	18	95

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14.030 – Hydraulic Fishing Jar Assembly/Disassembly

DESCRIPTION	1-13/16" x 1/2" (1509)	2-1/4" x 11/16" (1510)	3-1/8" x 1-1/4" (1505)	3-1/8" x 1-1/2" (1625)	3-3/4" x 1-1/2" (1768)
Hex Sleeve (Flow Mandrel)	A590000	A446000	A412000	A690000	A690000
Keys, Hex Sleeve	A556000	A556000	A364000	A364000	A824000
Hex Wrench (Wash Mandrel)	A583000 (1" Hex)	A582000 (1-1/4" Hex)	A396000 (1-3/4" Hex)	A700000 (1-7/8" Hex)	A700000 (1-7/8" Hex)
Hex Wrench (Flow Mandrel)	A557000 (2" Hex)	A557000 (2" Hex)	A380000 (2-5/8" Hex)	A362000 (3-3/8" Hex)	A323000 (3-3/8" Hex)
Assembly Filler Nut	A444000	A444000	A401000	A401000	A401001
Assembly Spacer Nut	A443000	A443000	A399000	A673000	A673000
Spacer Sleeve	A445000	A445000	-	-	-
Pressure Piston Installer / Remover	-	-	A417000	-	-
Adapter (Push / Pull Tool)	-	-	-	-	-
Threaded Clevis Rod (Push / Pull Tool)	-	-	-	-	-
Loaded Lip Seal Installer	A576000	A576000	-	-	-
Hex Socket for Flow Mandrel	-	-	A562000	-	-
Debris Remover	A595000	A594000	A577000	A577000	-
Drift	G897001	G897003	G897006	G897016	G897016
Flow Mandrel I.D. No-Go Gage	-	-	-	-	-

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	84 of 100	Performance Drilling Tool Hydraulic Fishing Jar Service Manual					OEPS
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Hydraulic Fishing Jar Assembly/Disassembly Tools

DESCRIPTION	3-3/4" x 1-15/16" (3372)	4-1/4" X 1-15/16" (3422)	4-1/4" x 2-1/8" (1503)	4-3/4" x 2-1/4" (1504)	5" x 2 1/4 (1804)
Hex Sleeve (Flow Mandrel)	A362000	-	A395000	A317000	A317000
Keys, Hex Sleeve	A364000	-	A364000	A318000	A318000
Hex Wrench (Wash Mandrel)	A351000 (2-3/8" Hex)	-	A380000 (2-5/8" Hex)	A322000 (3" Hex)	A322000 (3" Hex)
Hex Wrench (Flow Mandrel)	A323000 (3-3/8" Hex)	-	A321000 (4-3/8" Hex)	A321000 (4-3/8" Hex)	A321000 (4 3/8" Hex)
Assembly Filler Nut	A231000	A229000	A398000	A403000	A828000
Assembly Spacer Nut	A230000	A230000	A397000	A393000	A393000
Spacer Sleeve	-	A228000	-	-	-
Pressure Piston Installer / Remover	-	-	A416000	-	-
Adapter (Push / Pull Tool)	-	-	-	A315000	-
Threaded Clevis Rod (Push / Pull Tool)	-	-	-	A314000	-
Loaded Lip Seal Installer	-	-	-	-	-
Hex Socket for Flow Mandrel	-	-	-	-	-
Debris Remover	A271000	-	-	A328000	-
Drift	G897007	G897007	G897009	G897010	G897010
Flow Mandrel I.D. No-Go Gage	-	-	-	-	-

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	85 of 100	Performance Drilling Tool Hydraulic Fishing Jar Service Manual					OEPS
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Hydraulic Fishing Jar Assembly/Disassembly Tools

DESCRIPTION	6-1/4" x 2-1/4" (1506)	6-1/2" X 2-3/4" (1501)	7-3/4" x 3" (1507)	8" x 3" (1502)
Hex Sleeve (Flow Mandrel)	A331000	A353000	A338000	A338000
Keys, Hex Sleeve	A333000	A339000	A339000	A339000
Hex Wrench (Wash Mandrel)	A323000 (3-3/8" Hex)	A324000 (3-7/8" Hex)	A321000 (4-3/8" Hex)	A321000 (4-3/8" Hex)
Hex Wrench (Flow Mandrel)	A321000 (4-3/8" Hex)	A325000 (5" Hex)	A325000 (5" Hex)	A325000 (5" Hex)
Assembly Filler Nut	A561000	A643000	A603000	A656000
Assembly Spacer Nut	A393000	A642000	A610000	A610000
Spacer Sleeve	A584000	A644000	A604000	A604000
Pressure Piston Installer / Remover	-	-	-	-
Adapter (Push / Pull Tool)	A299004	A356000	A593000	A669000
Threaded Clevis Rod (Push / Pull Tool)	A308000	A357000	A340000	A340000
Loaded Lip Seal Installer	-	-	-	-
Hex Socket for Flow Mandrel	-	-	-	-
Debris Remover	A276000	A367000	A360000	A360000
Drift	G897011	G897013	G897014	G897014
Flow Mandrel I.D. No-Go Gage	-	-	-	-

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14.040 – Approved Synthetic Lubricants

1. Emerald Lubes Drilling Jar Fluid
2. J.A.M. Drilling Jar Fluid Prod# 560957
3. SCL-150 Synthetic Lubricant
4. Texaco Aviation Hydraulic Oil/BG Concentrate added
5. Nevus 7
6. Esso Synthetic 32 Lubricant
7. Anderol 495 Compressor Lubricant
8. Total Equivis ZS 32
9. Valvoline Ultramax HVLP 32
10. Lubrax Synthetic SCA 1032
11. Mobil Nuto H32 ISO VG 32
12. Q8 Handel 32 (non-synthetic)
13. Livo hydraulic oil VG32 208L-JH

 NOTE	NOTE
	In the absence of available previously approved fluids, the minimum technical requirements must be met by any substitute product as listed below. Weatherford specification should be sent to vendors to ensure compatibility of substitute product.

Dailey Hydraulic Fishing Jar Fluid

Minimum Physical Properties:

Flash Point, °C (°F) ISO 2592	>220 °C / 392 °F
Boiling Point	> 280 °C / 536 °F
Kinematic Viscosity cSt (40°C/104°F)	32
Kinematic Viscosity cSt (100°C/212°F)	5.4 ±.2
Pour Point °C /° F	-54/-65
Viscosity Index	110±20

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14.050 – Jar Specifications

Description					
Type of Tool	1-13/16 (1509)	2-1/4 (1510)	3-1/8 (1505)	3-1/8 (1625)	5 (1804)
Outside Diameter (in)	1-13/16"	2-1/4"	3-1/8"	3-1/8"	5
Inside Diameter (in)	1/2"	11/16"	1-1/4"	1-1/2"	2 1/4
Tool Joint Size (API)	1-13/16 Wilson FJ	1-1/4 Reg.	2-3/8 Reg.	2-7/8 PAC	4.000-4 ACME
Tensile Yield (lb)	75,000	110,000	250,000	240,000	350,000
Torsional Yield (ft-lb)	1,600	2,500	5,000	5,000	10,000
Max. Overpull Up/Down (lb)	20,000	30,000	45,000	45,000	60,000
Min. Housing Torque at Assembly (ft-lb) ¹	750	1,500	3,000	3,000	6,000
Max. Housing Torque at Assembly (ft-lb)	825	1,650	3,300	3,300	6,600
Approx. Length Closed (in)	84	94	108	104	120
Approx. Weight (lb)	50	80	180	160	400
Free Travel Up/Down Stroke (in)	4	4	4-1/4	4	5
Total Stroke (in)	5-1/2	6	6-1/8	6	7
Max. Circulating Pressure (PSI)	5,000	5,000	5,000	5,000	15,000
Max. Hydrostatic Pressure (PSI)	None	None	None	None	None
Max. BHT (°F)	400	400	400	400	400
Pump Open (sq-in)	1.1	1.8	2.4	2.1	7.67

¹ – While applying torque to each connection, if the dump valve releases before reaching the housing torque, the process must be performed again until the housing torque is met or exceeded by no more than 10 percent tolerance.

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JAR SPECIFICATIONS

Description					
Type of Tool	3-3/4 x 1-1/2 (1768)	3-3/4 x 1- 15/16 (3372)	4-1/4 (3422)	4-1/4 (1503)	4-3/4 (1504)
Outside Diameter (in)	3-3/4"	3-3/4"	4-1/4"	4-1/4"	4-3/4"
Inside Diameter (in)	1-1/2"	1-15/16"	1-15/16"	2-1/8"	2-1/4"
Tool Joint Size (API)	2-3/8 IF	2-3/8 EUE	2-7/8 IF	2-7/8 IF	3-1/2 IF
Tensile Yield (lb)	325,000	225,000	350,000	325,000	500,000
Torsional Yield (ft-lb)	10,300	3,750	15,000	15,000	20,000
Max. Overpull Up/Down (lb)	60,000	45,000	65,000	55,000	85,000
Min. Housing Torque at Assembly (ft-lb) ¹	5,200	3,000	6,000	6,000	14,000
Max. Housing Torque at Assembly (ft-lb)	5,720	3,300	6,600	6,600	15,400
Approx. Length Closed (in)	126	108	98	108	119
Approx. Weight (lb)	275	230	280	290	400
Free Travel Up/Down Stroke (in)	4-1/4	4-1/4	4-1/2	4-1/2	5
Total Stroke (in)	6-1/8	6-1/8	6-1/8	6-1/4	7
Max. Circulating Pressure (PSI)	5,000	5,000	5,000	5,000	5,000
Max. Hydrostatic Pressure (PSI)	None	None	None	None	None
Max. BHT (°F)	400	400	400	400	400
Pump Open (sq-in)	5.9	5.9	7.7	7.7	10.3

¹ – While applying torque to each connection, if the dump valve releases before reaching the housing torque, the process must be performed again until the housing torque is met or exceeded by no more than 10 percent tolerance.

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JAR SPECIFICATIONS

Description				
Type of Tool	6-1/4 (1506)	6-1/2 (1501)	7-3/4 (1507)	8 (1502)
Outside Diameter (in)	6-1/4"	6-1/2"	7-3/4"	8"
Inside Diameter (in)	2-3/4"	2-3/4"	3"	3"
Tool Joint Size (API)	4-1/2 IF	4-1/2 IF	6-5/8 Reg.	6-5/8 Reg.
Tensile Yield (lb)	832,000	934,000	1,600,000	1,750,000
Torsional Yield (ft-lb)	49,300	56,200	100,000	105,000
Max. Overpull Up/Down (lb)	200,000	175,000	260,000	300,000
Min. Housing Torque at Assembly (ft-lb) ¹	18,000	18,000	32,000	32,000
Max. Housing Torque at Assembly (ft-lb)	19,800	19,800	35,200	35,200
Approx. Length Closed (in)	146	153	166	167
Approx. Weight (lb)	800	1,200	2,000	2,300
Free Travel Up/Down Stroke (in)	6	6-1/4	7-1/2	7-1/2
Total Stroke (in)	8-1/4	8-1/2	9-3/4	9-3/4
Max. Circulating Pressure (PSI)	5,000	5,000	5,000	5,000
Max. Hydrostatic Pressure (PSI)	None	None	None	None
Max. BHT (°F)	400	400	400	400
Pump Open (sq-in)	11.4	10.6	15.3	15.3

¹ – While applying torque to each connection, if the dump valve releases before reaching the housing torque, the process must be performed again until the housing torque is met or exceeded by no more than 10 percent tolerance.

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14.060 – Maximum O.D. Wear Allowance

No diameter should fall below the measurement detailed in the table below along the complete length of the housing/component.

Refer to **GL-DRT-OEPS-L4-06 - Inspection Acceptance Criteria for Corrosion and Pitting**

Nominal Jar O.D.	Min. O.D. Acceptable	Allowable O.D. Wear
1-13/16"	1-13/16"	1/64"
2-1/4"	2-1/4"	1/32"
3-1/8"	3-7/64"	1/32"
3-3/4"	3-47/64"	1/64"
4-1/4"	4-15/64"	1/32"
4-13/16"	4-23/32"	3/32"
5"	4 7/8"	1/8"
6-1/4"	6-3/32"	5/32"
6-1/2"	6-11/32"	5/32"
7-3/4"	7-19/32"	5/32"
8"	7-27/32"	5/32"

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14.070 – Gauge / Measuring / NDT Equipment Calibration

All gauges / measuring equipment which are used during the repair and maintenance process needs to be calibrated and certified a minimum of year (1) and every six (6) months if inspecting per DS-1 category (DS-1 vol.4 section 7.5) Specific Requirements for Shop Qualification of Drilling Jars; a principle six monthly calibration check is required for WMPI power unit gauge (ammeter), black light meter (radiometer), field magnetometers/gauss meters and calipers (venire/micrometers if used). These gauges / measuring equipment need certification stickers with applicable certified date and re-certification due date. It is the responsibility of the local service center to adhere to this procedure. Auditors **WILL** be checking this as a top priority. These gauges / measuring equipment could include the following but not limited to:

- Test Rack Power Unit Gage
- Filling Unit Gage
- Break Out Unit Gage
- Line Pull Gage
- Air Compressor Gage
- Wet Magnetic Power Unit Gage
- Black Light
- Black Light Meter
- Field / Gauss / Hass Effect Indicator
- Torque Wrench
- Calipers

14.080 – Filling Unit Filter Replacement

Filling Unit Filters need to be replaced once a year with the “Date Last Changed” stamped / tagged on the filter or filter housing. The 55-gallon drum units have one screw on type filter and one high pressure 10-micron filter incased in a self-indicating housing which shows “**GREEN = GOOD**” and “**RED = REPLACE**”.

 NOTE	NOTE
	• Replace high pressure 10-micron filter immediately if indicating red.

 NOTE	NOTE
	• Service locations with heavy duty filling unit has one spin on filter, one high pressure 40-micron filter which runs in tandem with one high pressure 10-micron filter.

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	92 of 100	Performance Drilling Tool Hydraulic Fishing Jar Service Manual					OEPS
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14.090 – Toolbox List – A289000

Legacy#	JDE#	Description	Qty
A289022	105177	ABRSV, SHT, 120 GRIT	1
A289026	105181	PAPER, SAND, 220 GRIT SHEET	1
A032000	104882	WRENCH, ADJUSTABLE, 12.000 IN	2
A291018	105184	WRENCH, HEX, HD DRIVE, 0.187	2
901408	104611	BIT, WRENCH SOCKET, 5/16 HEX 1	4
901406	104609	SOCKET, HEX, 1/2 DRIVE 3/8	1
A294005	105191	WRENCH, HEX ALLEN, 0.050 IN	25
A294006	105192	WRENCH, HEX ALLEN, 0.062 IN	25
A294014	105193	WRENCH, HEX ALLEN, 0.1406 IN	50
A294018	105194	WRENCH, HEX ALLEN, 0.187 IN	50
900876	104582	WRENCH, ALLEN, .312 IN	50
901130	104584	ALLEN WRENCH, 0.375 IN L.A 0	25
A294050	105197	WRENCH, HEX ALLEN, 0.500 IN	2
901133	104586	WRENCH, ALLEN, 0.562 IN	25
A292018	105187	WRENCH, BIT, HEX, HD DRIVE 0.187	25
901410	104612	BIT, WRENCH SOCKET, 5/16 HEX S	50
901407	104610	BIT, WRENCH SOCKET, 3/8 HEX SH	25
A579001	105391	DIE, ROUND 4-40 UNC 1.000 IN	3
A579002	105392	DIE, ROUND 8.36 UNF 1.000 IN	3
A579003	105393	DIE, ROUND 0.250 UNS 1.000 IN	3
A579004	105394	DIE, ROUND STOCK, 1.000 IN	1

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14.090 Tool Box List – A289000 (continued)

Legacy#	JDE#	Description	Qty
A289023	105178	FILES	1
A243000	105127	UNIT, FILL, AND DISCHARGE 1 OU	3
A220000	105109	UNIT, FILL, AND DISCHARGE 1 OU	3
A361000	114401	ADAPTER, FILL, ASSEMBLY 5/8 X	3
A708000	114426	ADAPTER, FILL, 5/8 X 3/8	2
A289016	105172	FLASHLITE	1
A296000	105201	TOOL, GREASE GUN,	1
A289010	105166	HAMMER, BALL, PEIN	1
A289009	105165	HAMMER, SOFT FACE, 2.5 IN DIA	1
A239000	105125	TOOL, EXTRACTION, PRESSURE REL	1
A238000	105124	VISCO EXTRACTION TOOL	1
A574000	105388	JACK TOOL, CUTA 1870404B	6
A265000	105131	JACK, TOOL, CUT LEE A2810214B	1
P022000	107397	COMPOUND, LAPPING, GRADE A GRI	2
P021000	107396	COMPOUND, LAPPING, GRIT: F	1
P023000	107398	LAPPING COMPOUND, 3A, 16 OZ	2
P025000	107399	DYE, LAYOUT, STEEL BLUE, DYKEM	3
P026000	107400	DYKEM, LAYOUT, DRY SOLVENT	2

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14.090 Tool Box List – A289000 (continued)

Legacy#	JDE#	Description	Qty
A289013	105169	LEVEL, 6 IN, CROSS TEST VIAL	1
A289007	105163	PICK-O-RING	1
A289008	105164	GAUGE, O-RING	1
A304000	105230	PLATE, SURFACE,	1
901398	104606	ADHESIVE, LOCKTITE 27131	3
A289015	105171	PUNCH, DRIVE PIN, 0.187	2
901068	104583	REAMER, 0.187 SPIRAL FLUTEST	2
900005	104549	TOOL, REAMER, 0.281 SPIRAL FLUT	2
A581000	105397	GUN, RIVET	1
A289003	105159	TOOLBOX, ROLLAWAY,	1
A289017	105173	SCALE, 24" STARRRET, CH604R	1
A289006	105162	SCREWDRIVER, STANDARD, 6 BLADE	1
1584V405	101398	SCREW, SET, #4 40 UNC, 0.313 LG	25
1571V606	101332	SCREW, SET, #6 DIA, 40 UNF, 0.37	25
A289018	105174	SCREW, SET, STNLS 1/4 DIA 28 U	6
A289014	105170	WATCH, STOP	1
A30246P	105223	TAP, PLUG, 4/40 UNC	6
A30266P	105224	TAP, PLUG, 6-40 UNF	6
A30287P	105225	TAP, PLUG, 8-36 UNF	6
A303C9B	105229	TAP 0.250-28 UNF SPIROLOX	2
A302001	105222	TAP, PLUG, 0.250-48 UNC	3

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14.090 Tool Box List – A289000 (continued)

Legacy#	JDE#	Description	Qty
A302GBB	105226	TAP, BOTTOM, 1/2-20 UNF	6
900615	104568	TOOL, TAP, 0.625-18 SPIRAL LOCK	2
A302LEB	105227	TAP, BTM, 0.750-16 UNF	2
901368	104603	TAP, SPIRALOCK BOTTOM 0.750 - 1	2
P039000	107405	TEMPERATURE STICK, 300 DEGREE	3
P040000	107406	TEMPERATURE STICK, 600 DEGREE	3
A580000	105395	WRENCH, TAP, 0.063 TO 0.250 IN	1
A580005	105396	WRENCH, TAP, 0.156 TO 0.500 IN	1
T122000	114742	TESTER, JEVA JET ASSEMBLY	1
T123000	114743	TESTER, VISCO JET ASSEMBLY	1
A290000	105182	TIP, HAMMER SOFT FACE BROWN 2	4
A289002	105158	CHEST, TOOL	1
A289011	105167	WRENCH, SNAP ON #QC2R100	1
A289012	105168	WRENCH, COMPONENT, SNAPON QC3R	1
A289004	105160	PLIER, TRUARC	1
A027001	104879	PLIERS, STANDARD TIP, 16.000 I	1
A289025	105180	PLIERS, TRUARC, STANDARD, SMAL	1

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14.090 Tool Box List – A289000 (continued)

Legacy#	JDE#	Description	Qty
A289024	105179	TIP, TRUARC, 45	1
A289021	105176	CLAMP, VISE, GRIP, CHAIN	1
A289020	105175	WRENCH, VISE, GRID, MOD	3
B228V040	105578	BRUSH, FLEXONE, 4.00 TO 3.50 I	1
B228V050	105579	BRUSH, FLEXONE, 5.00 TO 4.50 I	1
B228V065	105580	BRUSH, FLEXONE, 6.50 TO 6.00 I	1
901403	104607	SOCKET, 0.500 IN DRIVE, 0.250 IN	3
901131	104585	WRENCH, ALLEN, 0.250 IN	10
901404	104608	BIT, HEX SHORT 0.250 IN	10
A451000	105368	HANDLE, HINGE, 1/2IN SQUARE DR	1
A237006	105123	DRIVE, ADAP, 0.375-0.500	1
A029000	104880	HAMMER, RUBBER	1
A804000	105506	TOOL SET, EXTRACTION	1
A239001	789486	TOOL, EXTRACTOR, 0.375	1

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CHAPTER: 15.00 – ASSOCIATED DRAWINGS

15.010 – Assembly Drawings

<u>SIZE</u>	<u>DRAWING NO.</u>
1-13/16" x 1/2"	1509TM01
2-1/4" x 11/16"	1510TM01
3-1/8" x 1-1/4"	1505TM01
3-1/8" x 1-1/2"	1625TM01
3-3/4" x 1-1/2"	1768TM01
3-3/4" x 1-15/16"	3372TM01 (Standard) 3372TM02 (Premium) 3372TM03 (Maximum)
4-1/4" x 2-1/8"	1503TM01
4-1/4" x 2"	3472TM01 (012 Option) 3472TM02 (013 Option)
4-3/4" x 2-1/4"	1504TM01
5" x 2 1/4"	1804TM01
6-1/4" x 2-1/4"	1506TM01
6-1/2" x 2-3/4"	1501TM01
7-3/4" x 3"	1507TM01
8" x 3"	1502TM01

15.020 - Rework Drawings

Rework drawings can be found in **GL-DRT-OEPS-L4-23 - Jar Rework Manual**.

If the drawing you require is not in this manual, please raise a query through [WISE](#).

15.030 - Drilling Jar Fishing Dimensions

Drilling Jar Fishing Dimension can be found in **GL-DRT-OEPS-L4-32 - Fishing Dimension Drawings Manual**

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CHAPTER: 16.00 – REVISION RECORD

Rev	Date	Change(s)	Relevant Paragraph	Revised By
A	06/04/2008	Converted manual to new format	All	C.M.
A	06/04/2008	Removed revisions per chapter and added one rev. for entire manual.	140.000	C.M.
A	06/04/2008	Added EEP Title Block	All	C.M.
A	06/04/2008	Added Safety Chapter	20.000 – 20.070	C.M.
A	06/04/2008	Added Toolbox List	110.080	C.M.
A	06/04/2008	Added Revision Record	140.000	C.M.
B	07/16/2009	- Chapter 20.070 Protective Clothing - Hydraulic Fishing Jar Metering Times – Modified the 7-3/4 X 3 and 8 X 3 values for Metering, Overall time, D1, D2, and D2-D1 - Chapter 80.020 – modify the test rack pressure chart for 7 3/4 & 8 PSI to 1000.	Page 8 Page 55 Page 54	M.W.
C	06/07/2010	The following sections have been revised:		M.W. / C.M.
		Publisher section	Page 2	
		80.020 – Rack Testing Procedure – inserted new value in the Test Rack Pressure Chart	Page 54	
		120.020 – Torque Chart	Page 70	
		Hydraulic Fishing Jar Assembly / Disassembly Tools Chart	Page 72	
		Jar Specifications Table	Page 76	
		120.060 – Maximum O.D. Wear Allowance	Page 78	
04	04/26/2011	Changed out the 1/2" Metering - :22 +/-:04 - Overall Time - :30 +/-:07 for the 4-1/4 x 2-1/8	Page 55	M.W. C.M
		Inserted the revised verbiage for the Gauge / Measuring / NDT Equipment / Calibration	Page 79	
05	05/03/2011	Move the Filling Introduction page after page 42	Page Error! Bookmark not defined.	M.W. C.M
06	08/30/2011	120.050 – Jar Specifications (added a tolerance to the housing torque)	Page 87 to 89	C.M./J.B.
07	09/02/2011	Added lines to indicate revision 6's changes	Page 87 to 89	J.B.
08	09/16/2011	Three hydraulic oils added to list of approved fluids.	Page Error! Bookmark not defined.	C.M./J.B.
09	12/30/2013	Updated safety information icons, created new document control #	All	K.W.

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09	12/20/2013	Added new oil to approved list,	Page 75	K.W.
10	07/01/2014	Added Livo hydraulic oil VG32 208L-JH to list of approved lubricants	Page 75	B.C.
11	1/8/2019	Updated to OEPS format	All	
12	3/11/2020	Updated statement 120.070 in Gauge / Measuring / NDT Equipment Calibration section.		RG
A	9/25/2020	In Section 120.20, revised Flow Mandrel to Wash Mandrel setting from 1,600 to 1,100.	120.20	CM
B	10/12/2022	Update guidance for Truarc Groove Inspection Update to DS-1 reference for gauge equipment/NDT Equipment Update Fluid Specification Update Safety guidance Update Shipping and Storage Guidance Update Headers and Footers	All	SK
C	10/05/2023	Update to include new Service Level Definitions and Guidance	Whole Document	SK

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